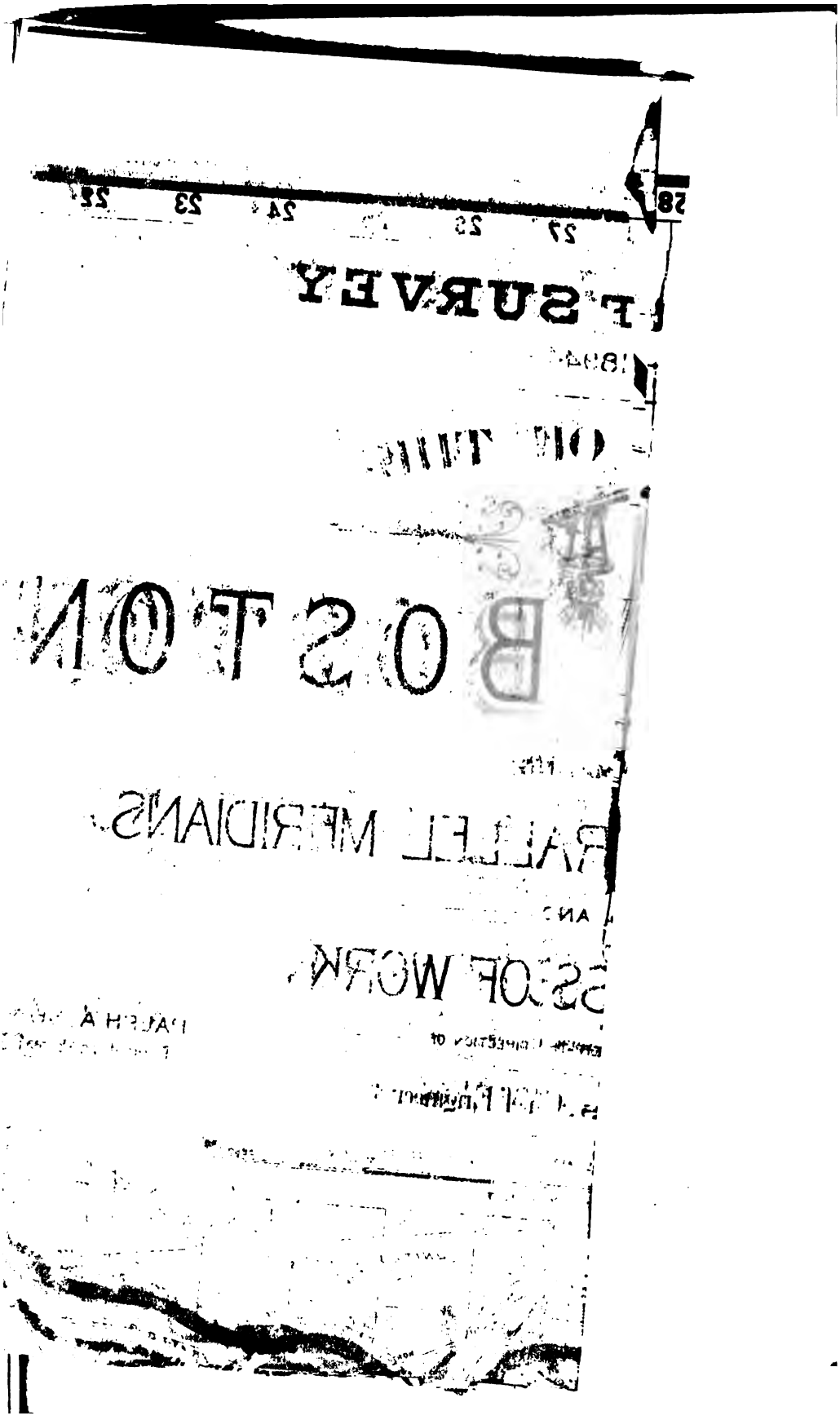
ANNUAL REPORT

OF THE

BOARD OF SURVEY

FOR THE YEAR 1893.



MT. BELLEVUE, WEST ROXBURY — Plan 10.

ANNUAL REPORT

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FOR THE YEAR 1893.

BOSTON:
ROCKWELL AND CHURCHILL, CITY PRINTERS.
1894.

OFFICE OF THE BOARD OF SURVEY,
BOSTON, February 1, 1894.

HON. NATHAN MATTHEWS, JR.,
Mayor of the City of Boston:

In presenting for your consideration a statement of the work accomplished by the Board of Survey, a brief statement of the history of the Board and of the causes which led to a demand for its creation may not be amiss. The city of Boston, perhaps more than any other city in the country, has suffered from the many evils attending the want of a comprehensive system of streets and the lack of suitable regulations governing the laying out of streets and ways. Starting as a town, with a few narrow and winding streets, the authorities to within a comparatively short time have been content to add to and extend the existing streets as the city expanded, with reference solely to local and individual needs and with an utter disregard of system and of future requirements. This lack of method caused a constant demand for street improvements and changes, and the large and constantly increasing outlay for street extensions and widenings, caused by the attempt to meet the ever-increasing demands of travel and to evolve some kind of system from the confused network of existing streets, became a source of anxiety to the tax-payers and caused a universal demand for reform in the methods of laying out streets. The cost of improvements of this character in the City Proper has been enormous; and it was evident that unless radical measures were at once adopted, the experience of the City Proper in this respect would be repeated in the outlying districts, which were being rapidly developed with the same disregard of system and of the public interests which characterized the laying out of streets within the original city limits. Although much of the outlying territory is still in a primitive state, as may be seen by reference to the various photographs accompanying this report, large tracts of land are being constantly put on the market in the wildest and most remote sections, and buildings are in process of erection at intervals throughout the entire territory, often in the midst of dense woods. It is evident that the interests of the public demand that the development of these large tracts, which practically determine the character of the ultimate development of the whole

territory, should be controlled by the city, and that action looking to that end has been taken none too soon. It is obvious that so long as streets continue to be laid out solely with reference to local and individual interests without due regard to the interests of the travelling public and to probable future requirements, the demand for widenings and extensions will never cease, and that the longer such improvements are delayed the greater the expense to the city will be, owing to the natural increase in valuations consequent on the growth of the city.

The remedy for the unsatisfactory state of affairs which has heretofore obtained consists in laying down a comprehensive system of streets covering the entire city, and taking into account not only present needs, but providing as far as may be for the growth and requirements of the future. When the vast amount of work necessary for the preparation of a suitable plan for the proper development of a city is taken into account, it is evident that the work cannot be properly carried out incidental to the work of any department, but requires the undivided attention of a board whose sole duty shall consist in the careful consideration and settlement of the innumerable questions which arise affecting both public and private interests. The first practical step looking to a solution of the problem was taken in the year 1891, by the Hon. Nathan Matthews, Jr., Mayor of the City of Boston, through whose efforts a bill was drafted and presented to the Legislature, providing for the appointment of a Board of Survey for the City of Boston, with authority to devise a scheme of streets for the entire city, to be adopted as a basis for all future street improvements. The bill met with the approval of the Legislature, and on the eleventh day of May, 1891, became a law, with the title of "An Act relating to the location, laying out, and construction of highways in the city of Boston." [Chap. 323 of the Acts and Resolves of 1891.] The provisions of the bill have attracted the attention of city authorities throughout the country, and since the work of the Board has been in progress much interest has been manifested in the subject and in the methods adopted by the Board in the prosecution of the work. Inquiries have been frequent, and the engineers of different cities have been sent at the instance of the authorities to investigate the workings of the Board, with a view to securing similar legislation, their experience having demonstrated the necessity for some such action. The neighboring cities of Quincy and Newton have already taken steps to secure the necessary authority for the appointment of Boards of Survey for their respective cities.

DUTIES OF THE BOARD.

The duties of the Board of Survey as defined by the Act are as follows, viz.: "The Board of Survey shall, with all reasonable despatch, cause to be made under its direction plans of such territory or section of land in said city as said Board may deem necessary, showing thereon the location of such highway or the location of such highways, whether already laid out or not, as said Board shall be of the opinion the present or future interests of the public will require in each territory, showing clearly the directions, widths, and grades of each highway." It will be seen that the work of the Board is of a very complicated and exacting nature, involving the consideration and application of all the practical principles of the laying out of cities. The application of these principles to a city like Boston is rendered exceedingly difficult by reason of the character of the existing streets, which do not lend themselves readily to an ideal scheme, but which must necessarily be incorporated in any laying out on account of the great expense and many complications attending any material change from the existing lines.

LAYING OUT OF CITIES.

There are two ways of laying out cities. One is by adding to and extending existing streets and establishing local streets as the demands of building require. The other is by providing a general plan as a basis for further development — to the end that all new streets when laid out shall form parts of a comprehensive scheme which shall subserve the public as well as private interests. The first method has been tried by the city of Boston with most unsatisfactory results. The second method has been adopted and is now in practical operation through the work of the Board of Survey. Sufficient progress has already been made to demonstrate its superiority over the old method, and the wisdom of the change is now generally conceded.

GENERAL PRINCIPLES.

The application of the second or ideal method involves the consideration of innumerable questions affecting not only the business interests of the community and the health and general welfare of the inhabitants, but the whole future character of the city. The lines of traffic not only of the present but of the future must be determined as far as may be, and thoroughfares of sufficient width and of proper grades

to provide direct and easy means of communication between the city and the outlying districts and between the principal business centres within the city must be provided. The probable future development of the different sections must also be considered. While all projected streets must conform to and form a part of the general scheme, the character of the particular streets in any given district must be such as to meet the requirements of that particular district. In a section devoted to business interests, wide streets and easy grades giving the most direct means of communication will prevail. In a section given over to residential purposes more latitude is allowable and more attention should be given to æsthetic principles. Too much stress cannot be laid on the importance of the recognition of æsthetic principles even in so eminently practical a subject as the laying out of streets. The growing taste and appreciation of the beautiful in the people demands an opportunity for expression in the erection of artistic and attractive dwellings, and a recognition of this demand by the exercise of the skill and taste of the landscape architect in the laying out of streets in such a manner as to preserve and emphasize the natural beauty of our suburban districts will encourage the erection of a high class of dwellings, thereby increasing their desirability as places of residence and fostering a spirit which will make our suburbs an important and attractive feature of the city, and result in an enhancement of values which will add materially to the city's income. In this connection provision should also be made for open areas and public squares at frequent intervals for the benefit of the public health and to increase the attractiveness of the locality. The drainage of the different districts must also be considered and streets so laid down as to accommodate trunk sewers. Due attention should be given to the interests of property owners, and the streets so laid out with reference to each other as to allow of a practical and economical cutting up of the intervening land.

REQUIREMENTS.

The requirements of the Act necessitate the preparation of large district plans, showing the territory under immediate consideration, on which the proposed schemes of the Board can be outlined and submitted to the public for the purpose of receiving suggestions and criticisms and for the proper consideration of the interests of property owners. In the preparation of these plans all the available material in the possession of the different city departments has been utilized, supplemented by actual surveys by the engineers of the

VIEW SHOWING CHARACTER OF COUNTRY — Plan 6.

Board of Survey. It is further required that all plans to be filed shall show the location of all existing and projected streets, with their directions, widths, and grades. An accurate topographical survey of the city is absolutely indispensable to the proper consideration of the various points to be determined in meeting these requirements. The possession of an accurate plan of the city as a basis for the operations of the Board would have materially advanced the work; but it was found that, although much time and money had been expended on surveys by the different city departments, no accurate survey of the city as a whole or of any considerable portion thereof had ever been made; the results of former surveys consisting mainly of individual streets and isolated districts having no relation to or connection with each other, the principal value of which was in the preparation of the district plans before referred to. It was also found that the only plan of the city in existence was one published by private parties, which was the result of compilations of such data as could be obtained without resorting to a survey. This plan is on a very small scale and is of little value in the work of the Board. In consideration of these facts it became necessary to enter at once upon an accurate survey of the city. In view of the importance of the work and its permanent value to the city, and to avoid the necessity for any extended surveys on the part of the city in the future, it was decided to conduct the survey on scientific principles according to the most approved methods, and to adopt a system of location which should answer for all time. The experience of foreign countries and of the States and cities of this country in which surveys of this character have been made, is that they are many times more valuable than their cost in the consideration of public improvements, the assessment of taxes, and in all matters in which an accurate and reliable means of location and description are required.

Although the importance of such work appeals at once to the scientific mind and to all who are conversant with the many difficulties and complications arising from inaccurate surveys and methods of location, the general public is slow to appreciate the value of work of this character and disposed to become impatient at the apparently slow progress necessary to obtain accurate results; but when once completed its practical value in matters relating to both public and private interests in property will be apparent to all. The importance of accurate surveys as a means of locating streets and property lines and as a basis for the accurate description of property in conveyances is best appreciated by lawyers, conveyancers, and surveyors, on whom devolve the duty of recon-

ciling as best they can the conflict of interests caused by faulty descriptions, based on inaccurate surveys. The proposed legislation in regard to land registration now pending before the Legislature of this State, and known as the Australian or Torrens system, is due to the dissatisfaction of conveyancers and others immediately concerned, with the unsatisfactory and unreliable methods of location and description now in use. The method of location adopted by this Board will furnish a basis for the description and absolute location of property beyond dispute. Its use will greatly facilitate the work of conveyancers by entirely eliminating the factor of uncertainty caused by the duplication of street names and by changes in the ownership of abutting estates, and it is probable that in the proposed legislation referred to, an effort will be made to secure its adoption as a basis for all descriptions in deeds of conveyance.

DEFECTS OF ORDINARY METHODS OF LOCATION.

Should the fences, walls, and buildings which serve as the initial points of reference in the description in a large proportion of deeds of conveyance be obliterated, a contingency which may at any time arise, it would be impossible in a great many cases to reëstablish the boundary lines with any degree of accuracy. This would be equally true of the streets of a city, especially in the suburban districts, under the prevailing methods of location by reference to buildings, trees, stone walls, and other perishable monuments. The experience of the city of Detroit, which was practically destroyed by fire in the early part of the century, demonstrates the truth of this statement. The landmarks and points of reference were destroyed by the fire, and it was found to be impossible to restore the street lines and boundaries of estates. The solution of the difficulty was intrusted to a commission, who were obliged to devise an entirely new plan of laying out for the city, dividing the lots among former owners as equitably as possible. Litigation caused by these changes is still of frequent occurrence. The great fires in London, Chicago, and Boston furnish more recent examples of similar difficulties arising from the same cause, and emphasize the importance of adopting suitable methods of location to prevent their recurrence in the future. The completion of the surveys instituted by the Board of Survey under the method of location adopted by them would render such a contingency an impossibility in the city of Boston.

VIEW IN PLAN 12 — WEST ROXBURY.

METHODS ADOPTED.

After a careful consideration of the advantages and disadvantages of the different methods of location as shown by the experience of this and other cities, it was decided to adopt a system of location by rectangular coördinate positions, determined with reference to two imaginary meridian lines at right angles to each other, running north and south, and east and west, and passing through the centre of the State House dome as an initial point, the geographical position of which had already been determined by the United States Coast and Geodetic Survey. The surveys of the Board were thus directly connected with the Government Surveys. By a series of lines parallel with these meridians, the entire city has been blocked out into squares of 10,000 feet on a side, which are designated by letters. These squares are subdivided into squares of 1,000 feet on a side, which are numbered from 1 to 100 inclusive, as shown on plan accompanying this report. Each official plan filed embraces the territory included in one of the smaller squares of 1,000 feet on a side, and is designated and known by its proper letter and number as A 1, B 2, etc. (See plan.) By reference to the general plan the situation of any particular square and its relation to and distance from any given point is apparent at a glance. The final plans which are filed in the office of the City Surveyor are on a scale of 1 in 250, and show the existing streets and the new streets projected by the Board of Survey with their location, widths, and grades. The property lines of all estates affected by the projected streets and by proposed changes in existing streets are also shown, together with the amount of land taken from individual estates by the proposed changes. The preparation of this information required the survey of all estates through which new streets are located or on which widenings are shown. It also necessitated an examination of the title to, and the adjustment of the boundary lines of, all estates affected. Up to the present time nearly 4,000 titles have been examined in this connection. The section lines enclosing each plan correspond to the parallel meridians before referred to, and their distance from the initial meridians passing through the State House is given on each plan, thus defining the geographical position of the section at once. The azimuths of all street lines from the State House meridian are shown on the plans and the coördinate positions of the street corners; tangent points of curves, etc., are also given. By this method of location the position of any point

is absolutely fixed entirely independent of local objects, and can at any time be reëstablished with mathematical accuracy. The distance between any two points in the same square or between any two points within the limits of the survey, and the bearing of the connecting line, can be determined at once by the solution of a right-angled triangle, the sides of which are obtained from the ordinates of the points, the hypothenuse of the triangle being the required distance. For convenience in establishing the points on the ground, stone bounds, firmly set in concrete, have been located at frequent intervals. These monuments with their coördinate positions are shown on the plans, and by their use the street lines can be accurately established by any competent surveyor beyond possibility of dispute.

The adoption of a plan of the city, divided according to the above-described method, to be used as a common basis of reference and description in all matters relating to the location of streets and estates, the assessment of taxes, etc., would result in a uniformity of description which would be of material advantage to the interests of the city.

SURVEYS.

The surveys of the Board have been conducted with great accuracy, the most approved methods being adopted and every precaution taken to avoid error. The survey is based on an observed and computed triangulation, which is essential to preserving distances and directions over extended areas. Positions established by the United States Coast and Geodetic Survey were taken for the primary points in the triangulation, from which a system of triangles was projected covering the entire city. (See plan.) Secondary stations have been established on prominent points throughout the city, from which other points have been transferred to the ground at frequent intervals, with which the local surveys have been connected and from which the coördinates have been computed. A statement of the methods employed in the triangulation, the primary points used, and tables showing the positions of all points established may be found under the heading Triangulation.

Good progress has been made on the survey of the city considering the difficulties encountered. The southern portion of the city, lying between Dorchester bay and the Neponset river on the east and Brookline and Newton on the west is exceedingly rough and diversified in character, eminences rising often to the height of nearly 200 feet above the level of the sea, alternating with swamps and rocky

JUNCTION OF CODMAN AND MORTON STREETS, DORCHESTER.

ravines throughout almost the entire territory, while much of the country is covered with a thick growth of woods, requiring the constant employment of axemen in clearing the lines of survey. The uneven character of the country and the abrupt and frequent changes in elevation rendered an accurate survey of the topographical features indispensable for the proper determination of the grade of projected streets, and much time has been spent in establishing the necessary contours. The prosecution of this work over the rocks and hills and through dense woods has been necessarily slow and tedious. Some idea of the general character of the territory referred to may be obtained from the photographs of the different localities inserted in this report. In order that contemplated improvements might be delayed as little as possible by the work of the Board, preference has been given to those sections of the city in which improvements were in progress. The different districts already considered are fully described under their respective headings. These districts are in many instances widely separated, but in their consideration due attention has been paid to the general lay out of the whole city, that each may form a component part of a comprehensive scheme. The plans proposed by the Board have met with general approval, and although criticism on the part of individuals may be expected and efforts made to secure changes for the furtherance of private interests, the interests of the public imperatively demand that no interference with the plans, when once adopted, should be permitted. Any such interference will inevitably unsettle confidence and retard the development of the land. In the preparation of the plans, the fullest criticism has been invited, and every opportunity has been afforded to the public and to individuals to express their opinions; and the plans as adopted represent the best judgment of the Board in reconciling public and private interests. With the assurance that no change will be made in the lines as finally determined, individual interests will speedily adjust themselves and the proper development of the city be assured.

The work accomplished on the survey may be summed up as follows: Territory covered by preliminary surveys, 16,384 acres, as shown on the twelve large district plans in the office of the Board of Survey; completed surveys, 3,974 acres, including 162 miles of streets. The force engaged on the survey is now thoroughly organized and the work is progressing rapidly and systematically, and with the large amount of preliminary work already accomplished, can be carried to completion much more expeditiously in the future. It has taken years to educate the public to the necessity for

the survey now in progress, and the Board is deeply impressed with the importance of the work and its permanent value to the city, and deem it of the utmost importance that the work now so far advanced should be carried to completion.

The following is a statement of the progress and condition of the work of the Board of Survey. The territory so far treated by the Board, on the Back Bay and at Roxbury, Dorchester, Brighton, and West Roxbury, is shown first upon large plans of the sections of the localities that are taken up, and the work that has been done upon each is hereinafter given in detail, as follows:

VIEW IN PLAN 1.

PLAN 1.

This plan covers the territory bounded by the Boston & Albany Railroad (main line), the Brookline branch of the same, and the Back Bay Fens. It is a peculiarly situated tract of 105 acres of uninviting marsh land, separated from the city on the east by the Back Bay Fens, a barrier through which no mercantile traffic can penetrate; and on the other hand hemmed in and prevented from expansion into the growth of the city beyond by the surrounding railroads. This tract is divided into two sections by Boylston street.

The portion of this territory lying adjacent to the Back Bay Fens would naturally develop into a very desirable quarter for dwellings; in fact, it can scarcely be of value for any other purpose, the Park prohibiting all through mercantile traffic, the only public entrance for it to this entire territory being Brookline avenue. But while the lower half of this territory might establish and maintain for itself a high standard of values, unless extreme measures are adopted to redeem the upper half, it may ever remain inferior to the other owing to its proximity to the railroads. Considering its future, then, it is evident that if this district is left to shape itself, the result is sure to be disastrous for it, and eventually for the Fens also. To develop this territory properly, the sections on either side of Boylston street should not be treated separately, but the interest of the whole tract considered, and a plan designed to treat it as a unit. No better system for such a purpose could be considered than a radial one with streets diverging from a common centre. Boylston street, being practically determined upon and traversing the tract near its centre, offers the most appropriate situation for the location of this divergent point, at a spot in it midway between the Fens and Brookline avenue. The position being determined, a circle was selected as the most desirable figure for the divergent streets to radiate from.

Ordinarily, a circle from which streets diverge would form a very important feature for such a territory fronting on Boylston street. But more than this was desired, and it was considered especially important to make the location unusually attractive, to balance by the architectural features that would naturally seek display upon such a circle, and in the diverging streets with their vistas of the park, the acknowledged advantage of the park frontages in the other part of the territory.

The Board believe it has made a proper distribution of streets, that its plan is one that will meet the approval of a majority of the owners, and, when carried out, receive the approbation of them all, and the general public as well.

The streets in this locality the Board have made, almost invariably, — Boylston street, of course excepted, — 60 feet wide, believing this width to be most desirable, — considering the heights to which buildings are now carried, — and no more than sufficient, even with the addition of the space afforded by the usual restriction line in building, for a proper allowance of air and sunlight, as well as for greater protection in case of fire. The streets are broken into short blocks with distances between streets varying from 200 to 250 feet. The percentage of land contained in all the streets, old and new, exclusive of passageways, is comparatively small, being but 30%.

Appended is a plan of the territory, showing the proposed scheme of streets, and a statement giving in detail the progress and condition of the work upon it:

Completed Plan filed August 19, 1891, with City Surveyor.

Preliminary Plan showing existing public and private streets, owners' names, etc.; size, 11 ft. 6 in. by 8 ft. 9 in.; scale, 50 ft. to an inch. (Completed.)

Large Plan from actual survey in two sections; size of each, 11 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Twelve Sectional Plans; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

Index Plan; size, 4 ft. by 4 ft.; scale, $\frac{1}{1000}$. (Completed.)

Grade Plan of whole territory, comprising 12 sections; size, 4 ft. by 4 ft.; scale, $\frac{1}{1000}$. (Completed.)

Copy of Grade Plan for office use; size, 4 ft. by 4 ft.; scale, $\frac{1}{1000}$. (Completed.)

Grade Plans for 26 streets of total length of 3.7 miles; scale, $\frac{1}{1000}$. (Completed.)

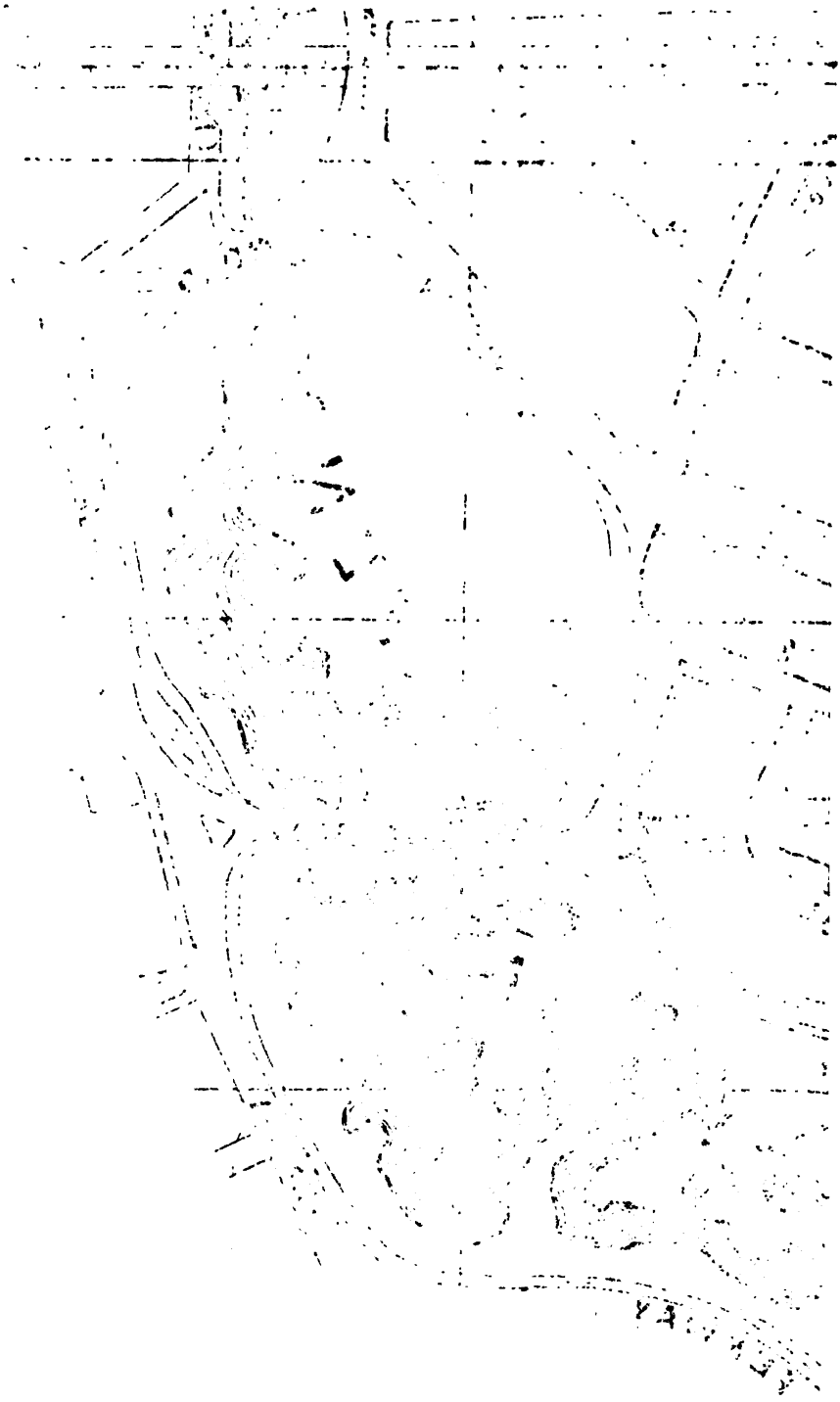
Plans and Profiles showing grades of Lansdowne, Wellesley, Boylston, Onslow, Salisbury, York, and Fairhaven streets, and Brookline avenue; scales, $\frac{1}{250}$ and $\frac{1}{50}$. (Completed.)

Estimates for the filling to Grade 12 of 90 parcels of land outside of the streets, with cost of same. (Completed.)

Estimates for the filling to Grade 12 of 74 parcels of land in the streets, with cost of same. (Completed.)

Estimates for the filling to established grade of 74 parcels of land in the streets, with cost of same. (Completed.)

Estimate for the filling to the established grade of Boylston street, with cost of same. (Completed.)



Public streets:
- Number of streets 1
- Length . . . . . 2,000 ft.=0.38 mile
- Area . . . . . 120,000 sq. ft.=2.75 acres

Private streets:
- Number of streets 3
- Length . . . . . 1,110 ft.=0.21 mile
- Area . . . . . 55,716 sq. ft.=1.28 acre

New streets established by Board of Survey:
- Number of streets 22
- Length . . . . . 19,660 ft.=3.72 miles
- Area . . . . . 1,228,971 sq. ft.=28.21 acres

Existing private streets adopted by Board of Survey:
- Number of streets 2
- Length . . . . . 670 ft.=0.126 mile
- Area . . . . . 33,431 sq. ft.=0.77 acre

Existing private streets widened and adopted by Board of Survey:
- Number of streets 1
- Length . . . . . 440 ft.=0.083 mile
- Area . . . . . 22,285 sq. ft.=0.51 acre

Total length of streets in Plan 1 . . . . 4.309 miles

Area of new streets established and private streets widened by Board of Survey, 1,217,990 sq. ft.=27.96 acres

Total area of old and new streets in Plan 1, 1,371,421 sq. ft.=31.71 acres

Percentage of area of Plan 1 absorbed by new streets established and private streets widened by Board of Survey 26.6%

Percentage of area of Plan 1 absorbed by all streets, old and new 30%

Number of estates surveyed 45

Number of conveyances copied 62

Number of conveyances looked up 250

Number of plans copied from Suffolk Registry . . 65

Number of buildings located and measured . . 26

PLAN 2.

A portion of the Back Bay, containing 133 acres. It is bounded by Charles river, Charlesgate West, the Boston & Albany Railroad (main line), the Brookline branch of same, and the town of Brookline. The three great avenues, Commonwealth avenue, Beacon street, and Brookline avenue, pass through it in such a manner as to virtually determine the location of the subordinate streets. On the north of Commonwealth avenue, between it and the river, from the termination of Bay State road to Essex street, a fine opportunity presented itself for the arrangement of streets with lots fronting on the river.

It would have been well perhaps, as far as the river-front was concerned, to have deflected at Deerfield street that portion of Bay State road ending here, making a river-way along the banks of the Charles river for the entire distance; but such a course would have resulted in too great a sacrifice of valuable land, and a compromise treatment was decided on. Bay State road, 60 feet wide, was extended directly to the centre of the tract, and here deflected to border upon the river.

Here is offered in a locality overlooking the Charles river, and destined with the boulevard along the embankment of the latter to be one of the most desirable in the city, an opportunity for the erection of high-class dwellings.

As in Plan 1, the streets have been made 60 feet wide, with about the same depths and lengths to the blocks. A feature of the studies in this territory was the extending of Audubon road from Audubon Circle at Beacon street by a 100-foot street which, deflecting from a straight line at Mountfort street and joining St. Mary's street at this point, continues parallel with and adjoining it to Commonwealth avenue, making a fine way to the Back Bay Fens from Brighton, and providing a suitable point for another bridge across the Charles river to Cambridge. The area of land in the streets is rather large, 44 per cent., which can be accounted for by the unusual widths of Commonwealth avenue and Beacon street.

Appended is a plan of the territory, and statement of the work that has been done upon it:

Preliminary Plan showing existing public and private streets, owners' names, etc.; size, 12 ft. 3 in. by 5 ft.; scale, 50 ft. to an inch. (Completed.)

Large Plan from actual survey; size, 32 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

VIEW IN PLAN 2.

Thirteen Sectional Plans; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

Index Plan; size, 4 ft. by 4 ft.; scale, $\frac{1}{1500}$. (Completed.)

Grade Plan of whole territory, comprising 13 sections; size, 5 ft. 6 in. by 3 ft.; scale, $\frac{1}{1000}$. (Completed.)

Grade Plans of 27 streets; scale, $\frac{1}{1000}$. (Completed.)

Plans and Profiles showing grades of Mountfort, Deerfield, Cummington, and St. Mary's streets, Audubon road, and Commonwealth avenue (2); scales, $\frac{1}{250}$ and $\frac{1}{50}$. (Completed.)

Three Plans showing different routes of Audubon road, with grades of same; scale, $\frac{1}{1500}$. (Completed.)

Plan and Profile showing grades of Commonwealth avenue from "Forks of the Roads" to Essex street, for use of Street Commissioners; scales, 150 ft. to an inch and 10 ft. to an inch. (Completed.)

Plan and Profile showing grades of Deerfield street, for use of Street Commissioners; scale, $\frac{1}{250}$ and $\frac{1}{50}$. (Completed.)

Two Sectional Plans of sections N 41 and M 30, complete with grades; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

These plans were approved by the Mayor and filed February 20 and May 24, 1892, with the City Surveyor.

Ten Sectional Plans of sections M 29, M 31, M 32, N 21, N 22, N 39, N 40, N 42, M 28, and M 33, complete with grades; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

These plans were approved by the Mayor and were filed January 4, 1894, with the City Surveyor.

In the territory of about 117.82 acres covered by the above sectional plans, there are comprised:

Public streets:

Number of streets	5
Length	5,086 ft. = 0.963 mile
Area	1,202,507 sq. ft. = 27.60 acres

New streets established, private streets adopted, and public streets widened by the Board of Survey:

Number of streets	15
Length	16,265 ft. = 3.08 miles
Area	744,338 sq. ft. = 17.09 acres

Totals:

Number of streets	18
Length	21,351 ft. = 4.04 miles
Area	1,946,845 sq. ft. = 44.69 acres

Percentage of area of the above territory absorbed by all streets, old and new 37.93%

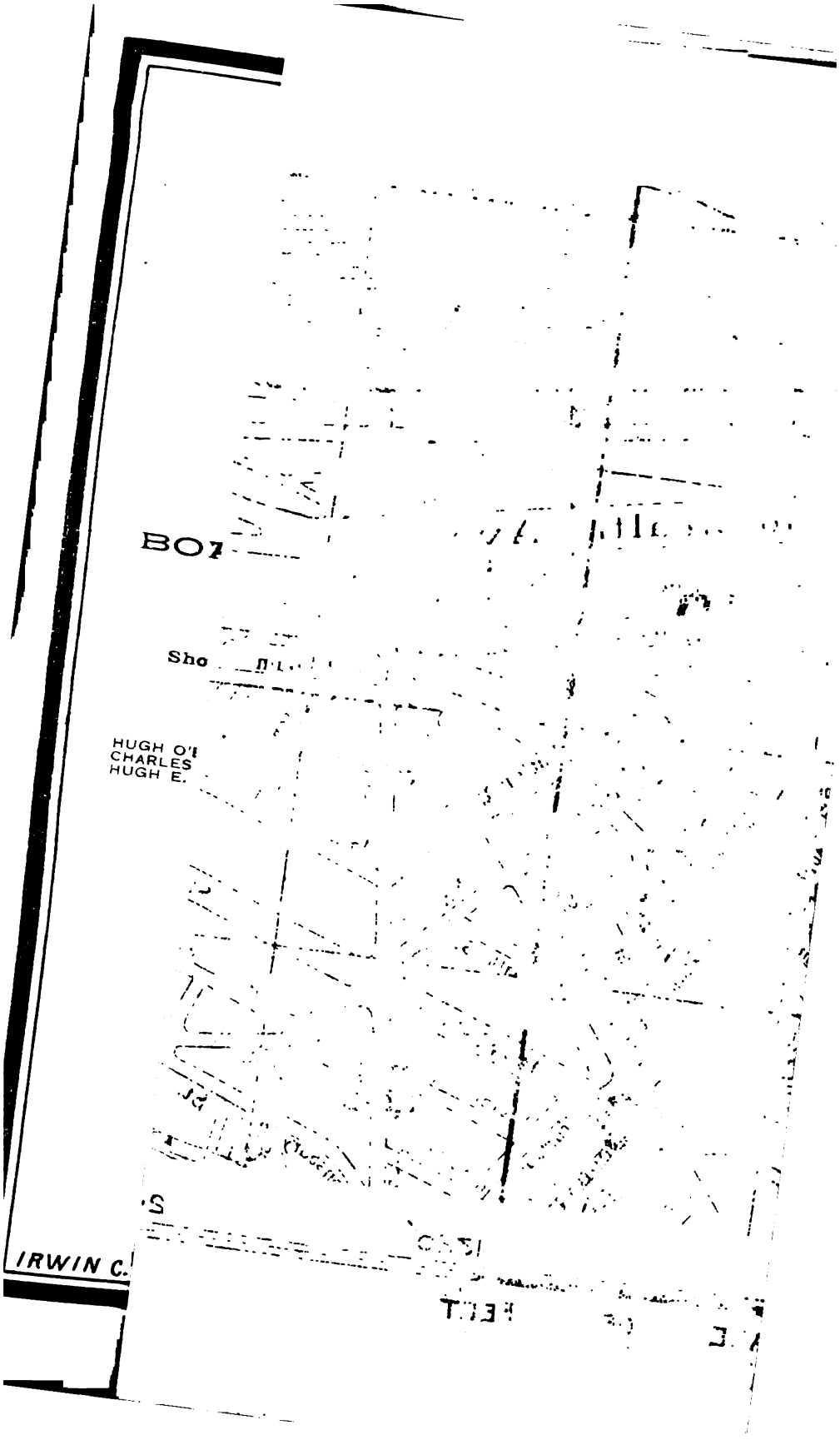
One sectional plan of section N 23, complete with grades; size 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed, but not yet filed.)

In the territory of about 15 acres covered by the above sectional plan, there are comprised:

Public streets:	
Number of streets	1
Length	765 ft.=0.14 mile
Area	122,400 sq. ft.=2.81 acres
New streets established, private streets adopted, and public streets widened by the Board of Survey:	
Number of streets	3
Length	1,260 ft.=0.24 mile
Area	62,415 sq. ft.=1.43 acre
Totals:	
Number of streets	4
Length	2,025 ft.=0.38 mile
Area	184,815 sq. ft.=4.24 acres
Percentage of area of above territory absorbed by all streets, old and new	27.70%

In connection with the sectional and other plans enumerated above, the following work has been done:

Number of estates surveyed	71
Number of conveyances copied and titles looked up	635
Number of plans copied from Suffolk Registry	135
Number of buildings located and measured	90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CHARLES
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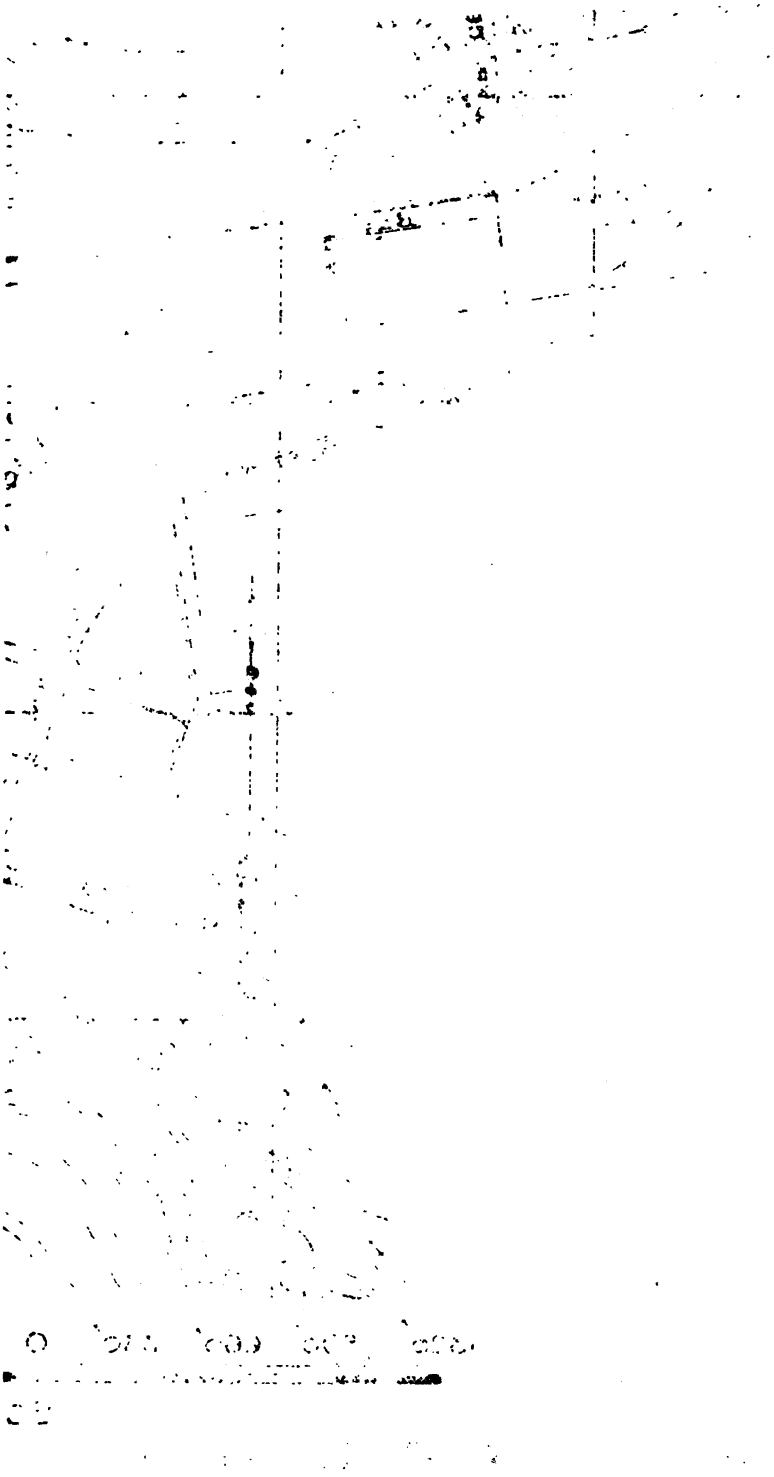

NEPONSET MARSHES FROM MARSH HILL — Plan 3.

PLAN 3.

This territory of about 1,551 acres is situated in Ward 24, and includes all the lands lying east of Dorchester avenue, from Park street to the Lower Mills, and extending along Neponset river to Dorchester bay.

Its natural features are somewhat varied, and were it not for an existing indiscriminate arrangement of streets, and too compact a settlement, thus localizing the studies for new streets in certain sections, it would offer an excellent field for ideal treatment.

A glance at the plan of the territory shows that this section, and in fact the whole ward, is lacking in main intersecting thoroughfares, not only for the traffic of the future, but for that of the present.

THOROUGHFARES.

The first consideration here was that of thoroughfares. Commencing at a point where Geneva avenue when extended will intersect Dorchester avenue, a street 70 feet in width, was projected in a straight line to a point near the junction of King and Adams streets. This will give a needed broad thoroughfare direct from Washington street, at the "Four Corners," down through the valley and across Dorchester avenue, providing a direct outlet for the section between the latter and the river, and also by connecting with another cross thoroughfare at a point near Adams and Ashmont streets, diverting the cross travel from Neponset and Quincy.

This street is one of a system of streets radiating from a circle 250 feet in diameter, having its centre at Minot street and the centre of Plain street extended, and is designed to be 70 feet wide, supplying a long-needed means of communication with Washington street.

Talbot avenue, intersecting Washington street at its junction with Centre street, offers a direct way to Franklin Field and to Franklin Park, and thence through the whole Park system.

The circle previously spoken of, located in the centres of Minot street and Plain street extended, was designed to promote the standard and elevate the growth of this section. As before stated, the diameter of the circle was made 250 feet. Minot street widened to 70 feet and passing through the centre of it provides a very desirable way from Neponset to Mattapan. From it diverge the 70-feet wide thoroughfare to Washington street and the parks; a street 60 feet wide, being an extension of Freeport street, the latter being

widened to the same width to its junction with Pope's Hill street; a 60-foot street leading to and providing an outlet for the developed territory on the hill and its vicinity near Marsh street, and, lastly, an 80-foot thoroughfare running directly to the Neponset river, allowing an opportunity for co-operation with the city of Quincy in bridging the river and connecting with a new thoroughfare designed by Quincy and ending on the Quincy side of the stream.

In addition to the thoroughfares above enumerated there has been located a boulevard 80 feet wide skirting the Neponset river from the Lower Mills to Neponset-avenue bridge. It is to be hoped that legislation will soon be enacted to improve the banks of the river and keep them forever open to this boulevard, making the latter most desirable for residences and for driving.

A street 60 feet wide, having its starting point opposite the Neponset station, continuing parallel with the Old Colony Division of the New York, New Haven, & Hartford Railroad to Park street opposite Clayton street, has been projected, with the intention of diverting from Neponset avenue the teaming from the Quincy stone quarries, giving it a street with a perfectly level grade and at the same time materially shortening the distance to the city. Adams street is to be widened to 70 feet its entire length in the district.

STREETS AND LOTS.

The lines of the thoroughfares having been determined, a system of streets providing for lotting the land in the vicinity of the circle was next considered. Any radical rearrangement here was likely to entail so much trouble upon the owners of small estates that but little could be done beyond devising a system to fit the existing one, — which has been accomplished with reasonably good effect.

The future use of the flats between the Milton Branch Railroad and the river appears so uncertain, it is almost impossible to surmise its character. A proper system has been arranged so that by the construction of some and the elimination of other streets, if not needed, it can be made to adjust itself to the possible different conditions. The hill beyond Marsh street is a fine elevation about 65 feet above the surrounding territory and the river, giving a very beautiful outlook towards Milton, Quincy, and the Blue Hills. The land on this hill affords a good opportunity for high-class development, and, if properly treated, cannot fail to give satisfaction to interested parties, as well as benefiting the adjoining territory. A system of streets has been designed

considering the lotting of the land, grades, etc., which fits it admirably.

From the hill south of Codman street, around Cedar Grove cemetery and to the river, the system adopted has been fitted as much as possible to existing conditions in streets there.

Of the section known as "Pope's Hill," quite an abrupt elevation, several studies were made with a view of the adoption of some of them. From the foot of this hill on the west, between Adams street and Dorchester avenue, and from King street to Ashmont street, a rectangular system of streets with not immoderate grades has been created which appropriately fits the location and is satisfactory to the owners and to the public. Studies of the balance of the territory in this plan are still in progress.

In fixing the widths of the streets in this district, it must be borne in mind that the Board had a somewhat different territory with different requirements from others that had been treated. This district is suburban, and its streets are not destined for many years to come to be lined with brick blocks. The present custom, when building, of restrictions keeping structures back of the street line, provides an opportunity, as the place becomes more thickly settled, to widen the streets, if necessary, at a comparatively small cost, as no buildings are then found within the lines of widening.

The percentage of street area in the territory considered, absorbed by all streets, old and new, is 22.55%.

Appended is a plan of the territory and a statement of the work that has been done upon it:

Public streets:	
Number of streets	43
Length	83,460 ft.=15.8 miles
Private streets:	
Number of streets	95
Length	67,300 ft.=12.73 miles
Number of estates in Plan 3	1,503

Pentagraphing 37 sectional plans from size 3 ft. by 4 ft., scale, 40 ft. to an inch, to size 17½ in. by 23 in., scale, $\frac{1}{1000}$. (Completed.)

Preliminary Plan showing existing public and private streets, owners' names, etc.; size, 14 ft. by 10 ft.; scale, $\frac{1}{1000}$. (Completed.)

Tracing 37 sectional plans for field work; size, 3 ft. by 4 ft.; scale, 40 ft. to an inch. (Completed.)

Plan from actual survey of 2 sections, W 34 and W 47; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, W 55 and W 66; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, W 73, W 74, and W 75; size, 14 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, W 72, W 89, and W 92; size, 14 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, Ff 9, Ff 12, and Ff 29; size, 14 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, Ff 8 and Ff 13; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, Ee 21 and Ff 30; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, Ee 20 and Ff 11; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, Ee 1 and Ff 10; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, W 90 and W 91; size 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, W 33 and W 48; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, W 86, W 87, and W 88; size, 14 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, W 65, W 76, and W 85; size, 14 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 4 sections, W 93, W 94, W 95, and W 96; size, 18 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, W 49 and W 50; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Thirty-two Sectional Plans of sections W 33, W 34, W 47, W 48, W 55, W 66, W 72, W 73, W 74, W 75, W 76, W 85, W 86, W 87, W 88, W 89, W 90, W 91, W 92, W 93, W 94, W 95, W 96, Ee 1, Ee 20, Ee 21, Ff 9, Ff 10, Ff 11, Ff 12, Ff 29, and Ff 30; complete with grades; size of each 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

These plans were approved by the Mayor, and were filed January 3, 1894, with the City Surveyor.

In the territory of about 644 acres covered by the above sectional plans, there are comprised:

Public streets:

Number of streets	20
Length	28,040 ft.=5.31 miles
Area	1,281,863 sq. ft.=29.43 acres

New streets established, private streets adopted, and public streets widened by the Board of Survey:

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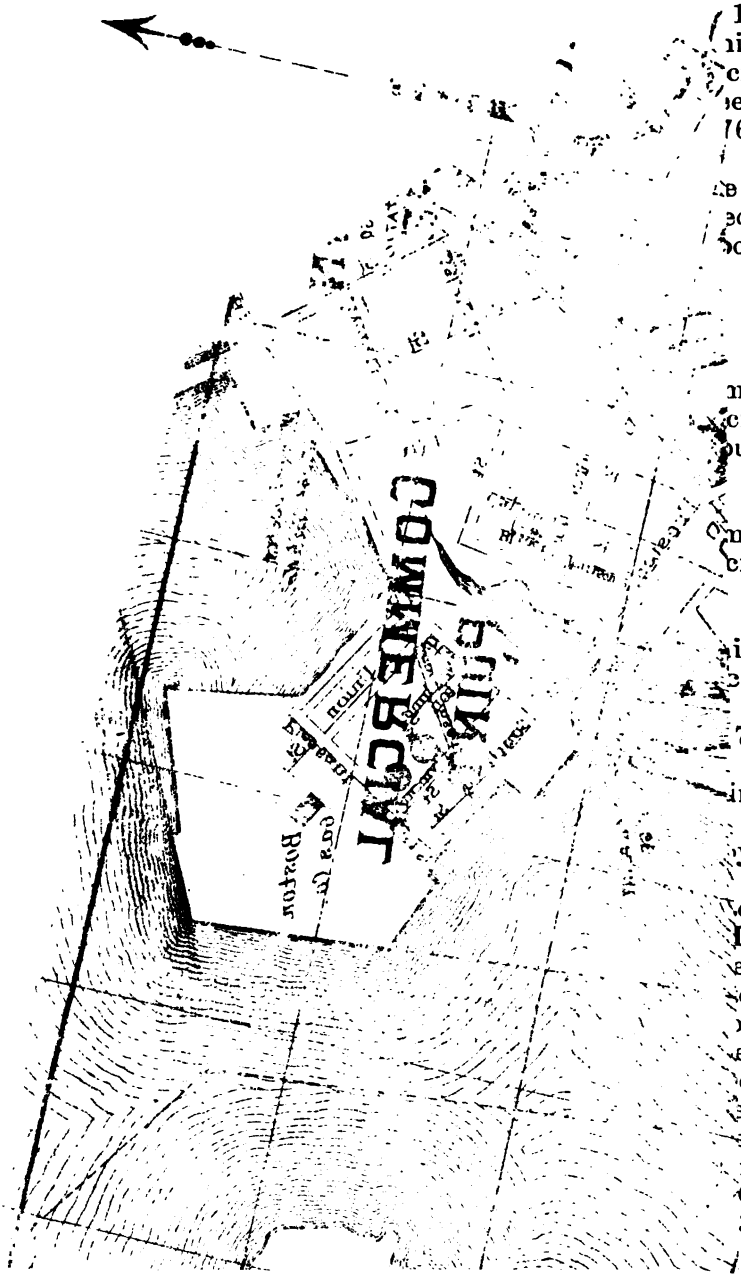


Number of streets 105
Length . . . . . 94,963 ft.=17.99 miles
Area . . . . . 5,104,950 sq. ft.=117.17 acres

Totals:
Number of streets 125
Length . . . . . 123,003 ft.=23.30 miles
Area . . . . . 6,385,913 sq. ft.=146.60 acres

Percentage of area of above territory absorbed by all streets, old and new 22.76%

Two Sectional Plans of sections W 49 and W 50; size of each 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed, but not yet filed.)

In the territory of about 46 acres covered by the above sectional plans, there are comprised:

Public streets:
Number of streets 3
Length . . . . . 2,375 ft.=0.449 mile
Area . . . . . 96,792 sq. ft.=2.22 acres

New streets established, private streets adopted, and public streets widened by the Board of Survey:
Number of streets 14
Length . . . . . 8,935 ft.=1.69 mile
Area . . . . . 299,500 sq. ft.=6.87 acres

Totals:
Number of streets 17
Length . . . . . 11,310 ft.=2.13 miles
Area . . . . . 396,292 sq. ft.=9.09 acres

Percentage of area of above territory absorbed by all streets, old and new 19.7%

Grade Plan of whole territory; size, 6 ft. by 3 ft. 6 in.; scale, 200 ft. to an inch. (In progress.)

Grade plan of 35 sections, in two sections; size, 7 ft. by 5 ft. and 5 ft. by 4 ft.; scale, $\frac{1}{1000}$. (Completed.)

Plans and Profiles showing grades of Marsh, Milton, Granville, Sheridan, Plain, Freeport (Parts I. and II.), Glide, Narragansett, Bertram, Tolman, Coffey, Fairview, Ashmont, Assabet, Rosemont, King, Queen, Templeton, Hillsdale, Richmond, Blackwell, Boutwell, Bearse, Vose, Malvern, Englewood, Richview, Fairfax, and Butler streets, Highland, Oak, and Pierce avenues, Frost-avenue extension, Train street, Agawam street, Tileston place, Huntoon street, Crest avenue, Shawmut park, Parkview street, Brook street, Patterson street, Hutchinson street, and streets numbered 88, 89, 90, 91, 92, 93, 94, 96, 97, 98, 99, 100, 102, 103, 106, 107, 110, 111, 112, 113, 116, 121, 123, 124, 129, 130,

135, 136, 137, 138, 139, 142, 143, 226, 241, 242, 243, 244, 245, 246, 249, 250, 253, 256, 271, 285, 286, 297, 298, 301. 302, 304, 315, 319, 320, 322, 323, 324, 325, 326, 328, 341. 342, 343, 349, 354, 366, 367, 368, 370, 371, 372, 374, 375, 376, 377, and 425; scales, $\frac{1}{250}$ and $\frac{1}{50}$. (Completed.)

Plan of Marsh-street hill, showing contours at every foot, in 2 sections; size of each, 14 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Marsh-street hill, comprised in 6½ sections, has been cross-sectioned, and levels have been taken at every fifty feet.

In connection with the sectional and other plans enumerated above — completed and in progress — the following work has been done:

Number of conveyances copied and titles looked up .	793
Number of plans copied from Suffolk Registry . .	284
Number of buildings located and measured . .	1,029

PLAN 4.

It covers 666 acres of land, a large proportion of which is built upon. The streets in some sections of it have for their entire lengths solid brick blocks. The undeveloped portion of this territory is comparatively small. It is bounded, practically, by the Back Bay Fens, the Boston & Albany Railroad, West Chester park, Huntington avenue, and the Tremont entrance to the Fens. In this territory the lines of the present streets are so laid down as to practically demand their extension, with but little variation, into the undeveloped part of the locality, and this, with the provision of proper intersecting streets, with the regulation widths of 50 and 60 feet, has been all that it has been found necessary to do. Some streets here the Board have made but 40 feet wide. Some of the existing streets and some of the new ones practically border on the park; others pierce the park lines and so obtain the advantages of park views. But little attention had to be paid here to the location of thoroughfares, as they exist in sufficient numbers, but their widths are scarcely adequate to the demands of the future; indeed, even for the present, encumbered as they are with two lines of electric car tracks. A notable instance is Huntington avenue, which should unquestionably be 100 feet wide.

Ruggles-street extension, entering the Tremont entrance near its junction with the Fens, will have an important influence on the future character of the entire street, and make it an important thoroughfare to Washington street, and thence to Warren street and Grove Hall beyond. It is deemed expedient, therefore, to give this street the width of 80 feet. Parker street being practically on the easterly border of the Back Bay Fens, and two of the Parkways entering it, will be much used, and should be 60 feet wide.

Columbus avenue lies in this district. This avenue should be extended.

The percentage of area of the above territory absorbed by all streets, old and new, is 26.2 per cent.

Appended is a plan of this territory and a statement of the work upon it:

Public streets:	
Number of streets	104
Length	105,000 ft.=19.88 miles
Private streets:	
Number of streets	69
Length	30,650 ft.=5.80 miles
Number of estates in Plan 4	3,242

Working Plan, showing existing public and private streets, angles, etc., with references to calculations of City Surveyor; size, 16 ft. by 7 ft.; scale, 50 ft. to an inch. (Completed.)

Preliminary Plan showing existing public and private streets, owners' names, etc.; size, 16 ft. 6 in. by 10 ft.; scale 50 ft. to an inch. (Completed.)

Plan from actual survey of 3 sections, M 46, M 47, and M 48; size, 16 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, M 53, M 54, and M 55; size, 16 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, M 71, M 72, and M 73; size, 15 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 1 section, M 67; size, 5 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, M 68 and M 69; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, M 89 and M 90; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Six Sectional Plans of sections M 46, M 47, M 48, M 53, M 54, and M 55, complete with grades; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

These plans were approved by the Mayor, and filed May 24, 1892, with the City Surveyor.

Two Sectional Plans of sections M 67 and M 68, complete with grades; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

These plans were approved by the Mayor, and filed January 9, 1893, with the City Surveyor.

Four Sectional Plans of sections M 69, M 71, M 72, and M 90, complete with grades; size of each, 4 ft. by 4 ft.; scale $\frac{1}{250}$. (Completed.)

These plans were approved by the Mayor and filed January 3, 1894, with the City Surveyor.

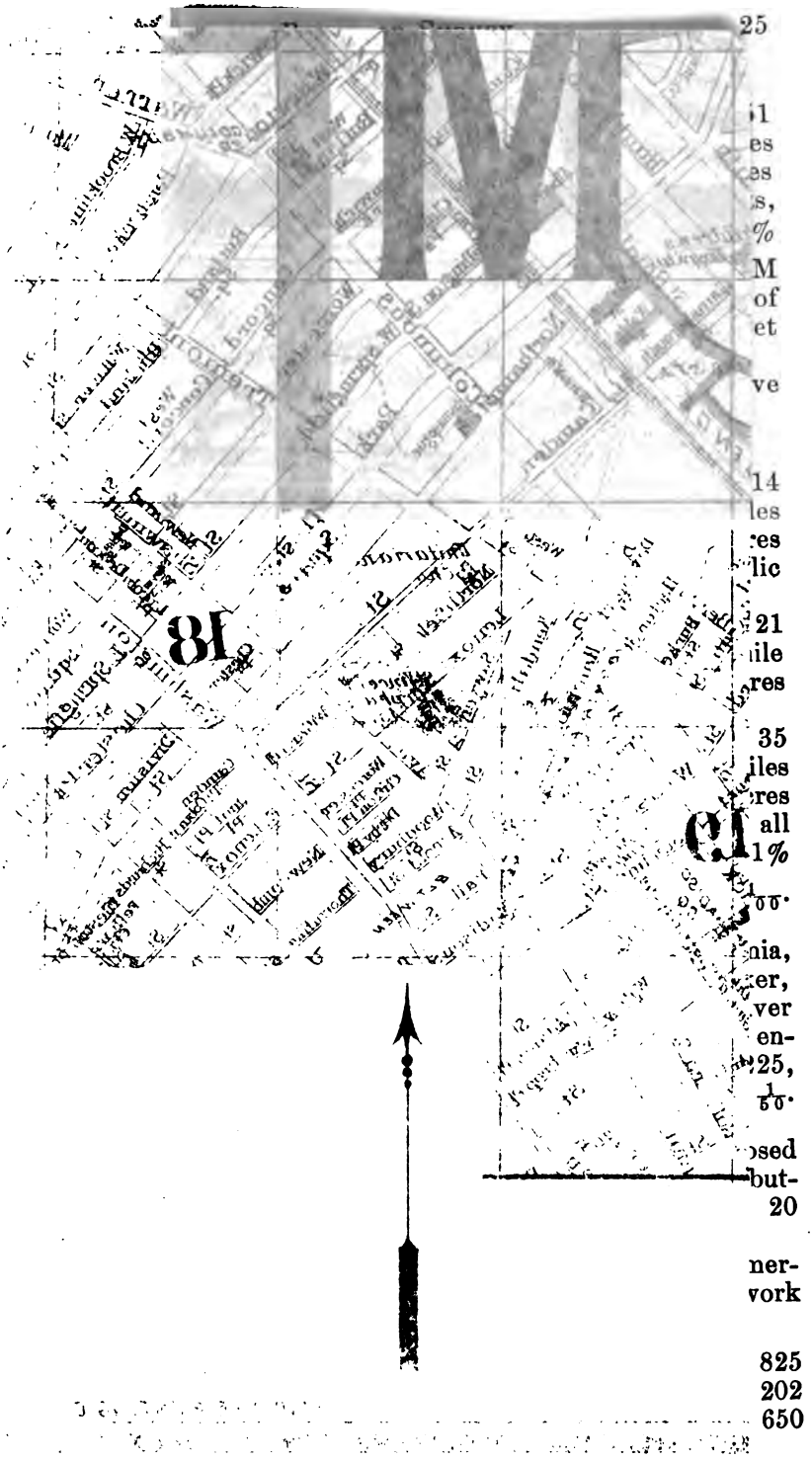
In the territory of about 153.05 acres covered by the above sectional plans there are comprised:

Public streets:

Number of streets	24
Length	16,870 ft.=3.20 miles
Area	1,034,000 sq. ft.=23.74 acres

New streets established, private streets adopted, and public streets widened by the Board of Survey:

Number of streets	27
Length	11,260 ft.=2.13 miles
Area	546,025 sq. ft.=12.54 acres



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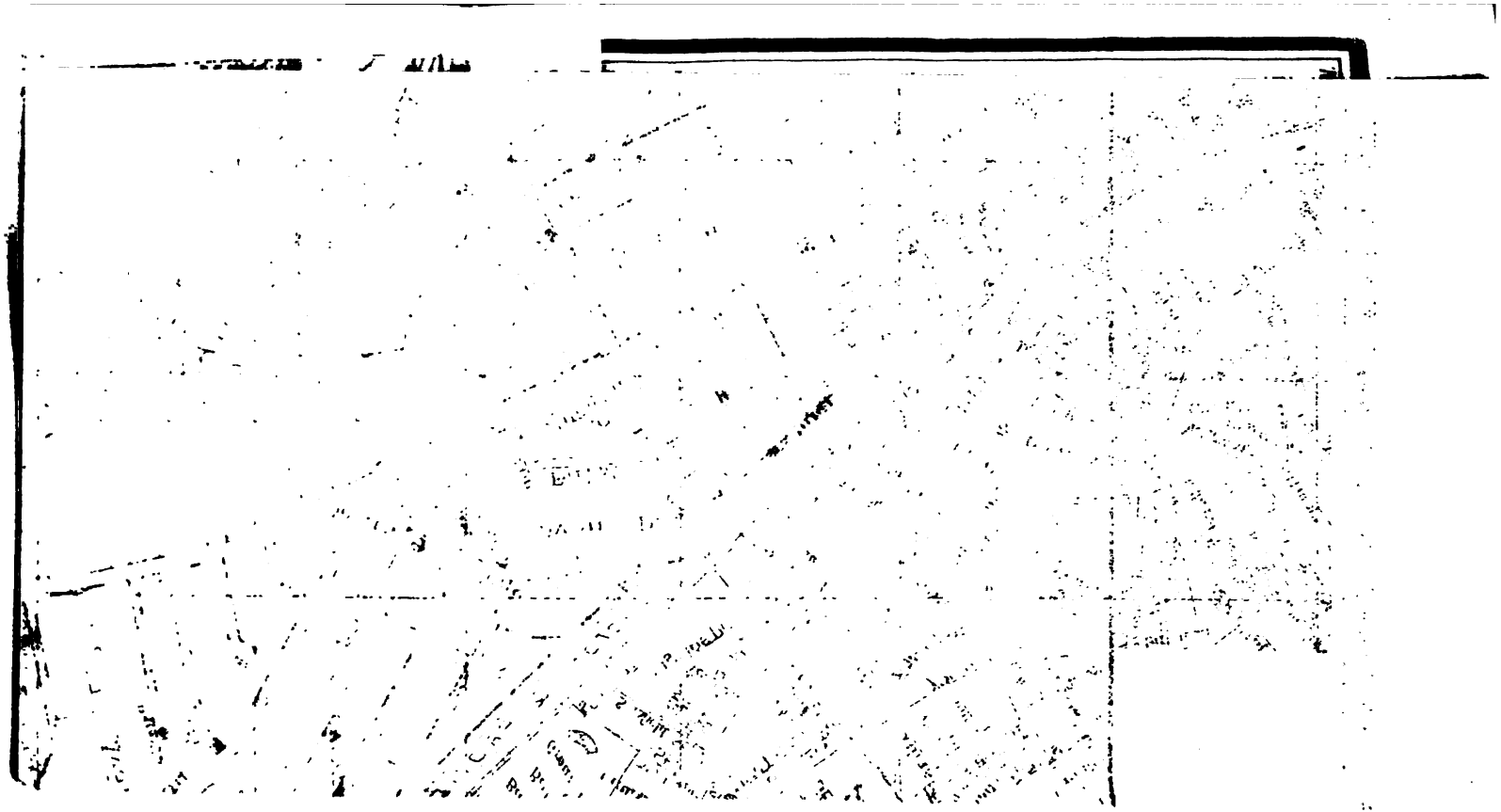


Totals:

Number of streets	51
Length	28,130 ft.=5.33 miles
Area	1,580,025 sq. ft.=36.27 acres

Percentage of area of above territory absorbed by all streets, old and new 23.69%

Six Sectional Plans of sections M 89, M 67 a, M 68 a, M 71 a, M 72 a, and M 90 a, complete with grades; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed but not yet filed.)

In the territory of about 86.73 acres covered by the above sectional plans there are comprised:

Public streets:

Number of streets	14
Length	114,035 ft.=2.66 miles
Area	712,270 sq. ft.=16.35 acres

New streets established, private streets adopted, and public streets widened by the Board of Survey:

Number of streets	21
Length	9,015 ft.=1.70 mile
Area	534,775 sq. ft.=12.28 acres

Totals:

Number of streets	35
Length	23,050 ft.=4.37 miles
Area	1,247,045 sq. ft.=28.63 acres

Percentage of area of the above territory absorbed by all streets, old and new 33.01%

Grade Plan of 18 sections; size, 10 ft. by 5 ft.; scale, $\frac{1}{1000}$. (Completed.)

Plans and Profiles showing grades of Belvidere, Caledonia, Cromwell, West Newton, Whipple, Turner, Astor, Parker, Gainsborough, Jarvis, Wellington, Baldwin, and Vancouver streets, Longwood avenue, Huntington and Tremont entrances, and streets numbered 216, 217, 218, 219, 220, 225, 274, 275, 276, 277, 278, and 279; scales, $\frac{1}{250}$ and $\frac{1}{50}$. (Completed.)

Plan and Profile of Huntington avenue showing proposed line of widening, takings, and grades, with names of abutting owners, etc., for use of Street Commissioners; size, 20 ft. by 5 ft.; scales, $\frac{1}{250}$ and $\frac{1}{50}$. (Completed.)

In connection with the sectional and other plans enumerated above — completed and in progress — the following work has been done:

Number of conveyances copied and titles looked up	825
Number of plans copied from Suffolk Registry	202
Number of buildings located and measured	650

PLAN 5.

Covers 1,309 acres of land located in Central Dorchester, Dorchester station on the New York & New England Railroad being almost exactly in the centre of the district. About 230 acres of it, from the railroad at Harvard station east to Dorchester avenue, has been treated by the Board. A system of suburban streets was arranged which is satisfactory to all concerned. The grade problems, although difficult at certain points, have been solved quite satisfactorily and no heavy grades will appear. East of Washington street the land is occupied principally by two large estates, and the absence of numerous property lines enabled the Board to work with greater freedom and achieve better results. Blue Hill avenue traverses the whole upper half of this territory. This avenue in the opinion of the Board should be widened to 120 feet.

The amount of street area in the territory considered absorbed by all streets, old and new, is 24.68%.

Appended is a plan of the territory and a statement of the work:

Public streets:	
Number of streets	48
Length	94,300 ft.=17.85 miles
Private streets:	
Number of streets	93
Length	91,000 ft.=17.23 miles
Number of estates in Plan 5	1,679

Pentagraphing 34 Sectional Plans from size 3 ft. by 4 ft.; scale, 40 ft. to an inch, to size 17½ in. by 23 in.; scale, $\frac{1}{1000}$. (Completed.)

Preliminary Plan, showing existing public and private streets, owners' names, etc.; size, 10 ft. by 8 ft.; scale, $\frac{1}{1000}$. (Completed.)

Tracing 37 Sectional Plans, for field work; size, 3 ft. by 4 ft.; scale, 40 ft. to an inch. (Completed.)

Plan from actual survey of 1 section, X 17; size, 5 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, X 18, X 23, and X 38; size, 14 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, X 24 and X 37; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, X 21 and X 22; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, X 19 and X 20; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Nine Sectional Plans of sections X 17, X 18, X 19, X 20, X 21, X 22, X 23, X 24, X 37, complete with grades, size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

These plans were approved by the Mayor and filed January 4, 1894, with the City Surveyor.

In the territory of about 207 acres covered by the above sectional plans, there are comprised:

Public streets:	
Number of streets	13
Length	14,273 ft.=2.70 miles
Area	669,470 sq. ft.=15.37 acres
New streets established, private streets adopted, and public streets widened by the Board of Survey:	
Number of streets	48
Length	36,763 ft.=6.96 miles
Area	1,592,965 sq. ft.=36.57 acres
Totals:	
Number of streets	61
Length	51,036 ft.=9.67 miles
Area	2,262,435 sq. ft.=51.94 acres
Percentage of area of above territory absorbed by all streets, old and new	25.14%

One Sectional Plan of section X 38; complete with grades; size, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

In the territory of about 23 acres covered by the above sectional plan, there are comprised:

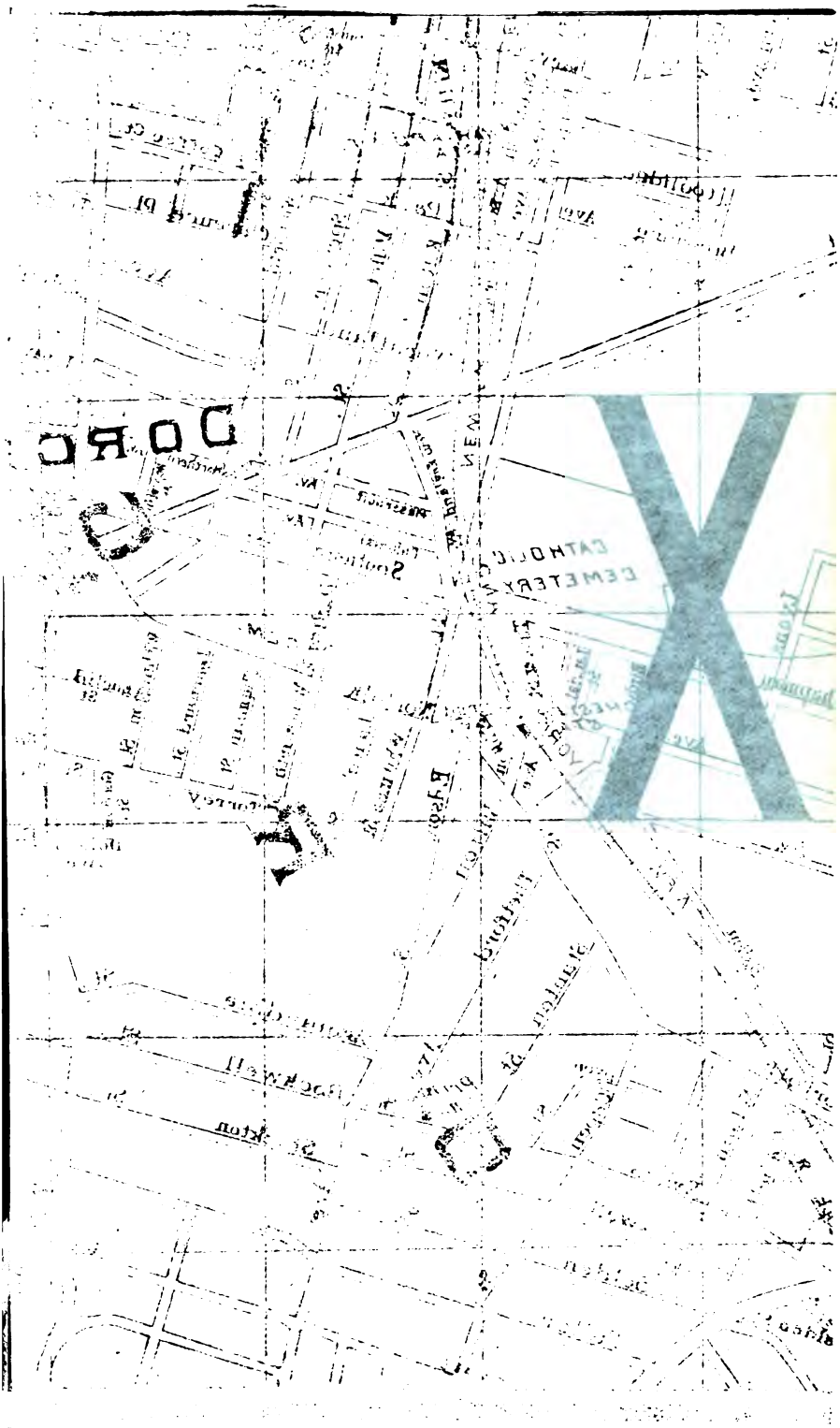
Public streets:	
Number of streets	5
Length	2,202 ft.=0.417 mile
Area	114,660 sq. ft.=2.63 acres
New streets established, private streets adopted, and public streets widened by the Board of Survey:	
Number of streets	8
Length	2,512 ft.=0.48 mile
Area	91,335 sq. ft.=2.10 acres
Totals:	
Number of streets	13
Length	4,714 ft.=0.89 miles
Area	205,995 sq. ft.=4.73 acres
Percentage of area of above territory absorbed by all streets, old and new	20.60%

Grade Plan of 10 sections; size, 5 ft. by 3 ft.; scale, $\frac{1}{1000}$. (Completed.)

Plans and Profiles showing grades of Harvard, Waterlow, Elmont, Kilton, Spencer, Whitfield, Athelwold, Park, Merlin, School, Algonquin, Bradlee, Herbert, Cook, Tremlett, and Orchardale streets, Coffee court, Bowdoin square, Bowdoin square westerly, and Bowdoin-square extension, Sidney street, Millet street, Head street, Fredonia street, Prescott place, Harvard avenue, Faxon street, Rosseter street, Chamberlain street, Waldeck street, Stratford street, Linsey street, and streets numbered 152, 158, 159, 227, 228, 229, 230, 237, 238, 260, 261, 265, 284, and 448; scales, $\frac{1}{250}$ and $\frac{1}{50}$. (Completed.)

In connection with the sectional and other plans enumerated above — completed and in progress — the following work has been done:

Number of conveyances copied and titles looked up .	360
Number of plans copied from Suffolk Registry . .	300
Number of buildings located and measured . .	868



BASE LINE THROUGH WOODS—Plan 6.

PLAN 6.

This plan comprises the part of the city known as Mattapan and the Lower Mills, and except in the villages named is quite sparsely settled. A small portion of the undeveloped section is low and swampy, but generally the territory is of good elevation, a large proportion of it being extremely rugged and well wooded, making the progress of locating streets and establishing building sites very difficult and extremely slow.

A portion, and a most difficult one, of this territory lying between the New York & New England Railroad, Morton, Washington, and Codman streets, Dorchester avenue, Neponset river and Blue Hill avenue, was first selected for treatment. Within these boundaries are located two hills, rocky, rugged and precipitous, rising to the height of nearly 200 feet above the sea-level. Like the "Marsh Street Hill" in Plan 3, these hills command another and even more extensive view of the surrounding country. Everything depends upon the proper treatment of such a region when the matter of providing it with streets is under consideration, a poor arrangement of them, with ugly and heavy gradients, being fatal to a legitimate and proper growth of the territory. Connected with the part to which the Board gave its first attention much field work had to be done, and innumerable studies made before a proper determination could be reached for streets with practicable grades; and afterwards a large amount of work was found in properly adjusting them on the ground.

THOROUGHFARES.

In considering thoroughfares for this section, Morton street first demands attention, leading directly to Franklin park and West Roxbury, and destined to be of great importance, as a connection of the Lower Mills village and the entire south-eastern section of Dorchester with the first-named section. It should, therefore, be made of liberal width, and the Board have placed it at 80 feet; an extension of the street at the same width is made in a straight line to Washington street at a point nearly opposite Richmond street.

Codman street, though having a rather heavy grade, is a street of considerable importance, leading into the section east of Dorchester avenue and connecting it with this district; it has been made 50 feet wide west of Dorchester avenue.

From Blue Hill avenue, between Morton street and the river, there is no cross-road to Washington street and Dorchester avenue — no way of reaching the Lower Mills except by Morton and River streets. The necessity for such a thoroughfare between these points is apparent. A feasible location was found, and a 60-foot street has been projected from Blue Hill avenue, at Mattapan station, on the New York and New England Railroad, in almost a straight line, with a maximum grade of 8 feet per 100 feet, and an average grade of 4 feet per 100 feet, to Dorchester avenue, at a point thereon opposite the new Dorchester park.

River street is widened to 60 feet for its entire length in this section.

From a point where River street leaves the bank of the Neponset river, a street 60 feet wide is projected, which, skirting the river, connects with River street at a point where the latter again touches the river-bank and becomes, from here to Mattapan, itself the marginal street.

Blue Hill avenue enters this territory and, as far as Boston is concerned, ends at the river. The Board repeat what has been said of it before, that it should be made 120 feet wide.

STREETS.

In creating a system of streets for this district, no attempt has been made to establish parallel streets in rectangular blocks. Under such conditions as these it would be impracticable, even if desirable, which it is not. The plan of streets made, averaging 50 feet in width, will, the Board think, prove both beautiful and useful in the practical working out upon the ground.

A comparison of a system of streets for one section of this territory, with a portion of the City Proper of equal area, is presented elsewhere in this report.

The percentage of territory under consideration, absorbed by all streets old and new, is 25 per cent.

Appended is a plan of this territory, with statement of the work upon it:

Public streets:	
Number of streets	67
Length	41,965 ft.=7.94 miles
Private streets:	
Number of streets	70
Length	36,310 ft.=6.87 miles
Number of estates in Plan 6	725

Pentagraphing 26 Sectional Plans from size 3 ft. by 4 ft.,

scale, 40 ft. to an inch, to size 17½ by 23 in., scale, $\frac{1}{1000}$. (Completed.)

Preliminary Plan showing existing public and private streets, owners' names, etc.; size, 9 ft. by 5 ft.; scale, $\frac{1}{1000}$. (Completed.)

Plan from actual survey of 2 sections, Ee 5 and X 96; size, 8 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, Ee 6 and X 95; size, 8 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, Ee 7 and X 94; size, 8 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, Ee 16, Ee 25, and X 85; size, 12 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, Ee 15, Ee 26, and X 86; size, 12 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, Ee 14 and Ee 27; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, X 84 and X 97; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, X 83 and X 98; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

Seven Sectional Plans of sections Ee 5, Ee 6, Ee 7, X 94, X 95, X 96, X 97; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed.)

These plans were approved by the Mayor, and filed January 3, 1894, with the City Surveyor.

In the territory of about 161 acres covered by the above sectional plans, there are comprised:

Public streets:

Number of streets	2
Length	2,945 ft.=0.56 mile
Area	134,350 sq. ft.=3.08 acres

New streets established, private streets adopted, and public streets widened by the Board of Survey:

Number of streets	31
Length	31,889 ft.=6.04 miles
Area	1,587,600 sq. ft.=36.45 acres

Totals:

Number of streets	33
Length	34,834 ft.=6.60 miles
Area	1,721,950 sq. ft.=39.53 acres

Percentage of area of above territory absorbed by all streets, old and new 24.55%

One Sectional Plan of section X 98, complete with

grades; size, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed, but not yet filed.)

In the territory of about 23 acres covered by the above sectional plan, there are comprised:

Public streets:
Number of streets 2
Length . . . . . 1,270 ft.=0.24 mile
Area . . . . . 53,300 sq. ft.=1.22 acre
New streets established, private streets adopted, and public streets widened by the Board of Survey:
Number of streets 7
Length . . . . . 3,941 ft.=0.746 mile
Area . . . . . 198,150 sq. ft.=4.55 acres
Totals:
Number of streets 9
Length . . . . . 5,211 ft.=0.99 mile
Area . . . . . 251,450 sq. ft.=5.77 acres
Percentage of area of above territory absorbed by all streets, old and new 25.09%

Six Sectional Plans of sections Ee 14, Ee 15, Ee 16, Ee 25, Ee 26, and Ee 27; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

In the territory of about 87 acres, not including the river, covered by the above sectional plans, there are comprised:

Public streets:
Number of streets 1
Length . . . . . 3,081 ft.=0.58 mile
Area . . . . . 143,771 sq. ft.=3.30 acres
New streets established, private streets adopted, and public streets widened by the Board of Survey:
Number of streets 26
Length . . . . . 15,263 ft.=2.89 miles
Area . . . . . 855,172 sq. ft.=19.63 acres
Totals:
Number of streets 27
Length . . . . . 18,344 ft.=3.47 miles
Area . . . . . 998,943 sq. ft.=22.93 acres
Percentage of area of above territory absorbed by all streets, old and new 26.6%

Four Sectional Plans of sections X 83, X 84, X 85, X 86; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$.

These plans will be ready for a second hearing about February 1, 1894. (In progress.)

VIEW IN THE WOODS—Plan 6.

In the territory of about 92 acres covered by the above sectional plans, there are comprised:

Public streets:

Number of streets	8
Length	3,210 ft.=0.61 mile
Area	147,460 sq. ft.=3.38 acres

New streets established, private streets adopted, and public streets widened by the Board of Survey:

Number of streets	18
Length	15,995 ft.=3.03 miles
Area	762,185 sq. ft.=17.50 acres

Totals:

Number of streets	26
Length	19,205 ft.=3.64 miles
Area	909,645 sq. ft.=20.88 acres

Percentage of area of above territory absorbed by all streets, old and new 22.7%

Grade Plan of 10 sections; size, 12 ft. by 5 ft.; scale, $\frac{1}{1000}$. (In progress.)

Index Plan; size, 10 ft. by 5 ft.; scale, $\frac{1}{1000}$. (In progress.)

Plan showing contours at every 5 feet; size, 7 ft. by 5 ft.; scale, $\frac{1}{1000}$. (Completed.)

Two tracings showing contours at every 5 feet; size of each, 10 ft. by 5 ft.; scale, $\frac{1}{1000}$. (Completed.)

Plan of sections Ee 2, Ee 3, Ee 18, Ee 19, X 98, X 99, X 82, and X 83, showing contours at every foot; size, 10 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan of sections Ee 3, Ee 4, Ee 17, Ee 18, X 83, X 84, X 97, and X 98, showing contours at every foot; size, 15 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan of sections Ee 4, Ee 5, Ee 16, Ee 17, X 84, X 85, X 96, and X 97, showing contours at every foot; size, 17 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan of sections Ee 5, Ee 6, Ee 15, Ee 16, Ee 25, Ee 26, X 85, X 86, X 95, and X 96, showing contours at every foot; size, 20 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan of sections Ee 7, Ee 8, Ee 13, Ee 14, Ee 27, Ee 28, X 87, X 88, X 93, and X 94, showing contours at every foot; size, 16 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan of sections Ee 8 and Ee 13, showing contours at every foot; size, 6 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

In the above plans portions of the same sections show on different plans. Grade plan of 14 sections; size, 12 ft. by 5 ft.; scale, $\frac{1}{1000}$. (In progress.) Area, 271 acres.

Plans and Profiles, showing grades of Morton, Codman,

West, Selden, Oakland, Fremont, Hollingsworth, Rosewood, Rockdale, and Astoria streets, and Cook court, and streets numbered 500, 502, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 549, 553, 554, 564, 565, 566, 567, and 569; scales, $\frac{1}{250}$ and $\frac{1}{50}$. (Completed.)

In connection with the sectional and other plans enumerated above, completed and in progress, the following work has been done:

Number of conveyances copied and titles looked up .	220
Number of plans copied from Suffolk Registry .	34

For the purpose of comparison of percentages of street area two districts are taken, one consisting of a portion of the City Proper, and the other of an equal area of Plan 6, through which streets have been projected by the Board of Survey.

The City Proper District, commencing at the corner of Washington street and the Boston & Albany Railroad, is bounded by and includes the Boston & Albany Railroad, Ferdinand street, Cortes street, Berkeley street, Columbus avenue, Park square, Boylston street, Tremont street, Scollay square, Court street, Bowdoin square, Green street, Leverett street, Causeway street, Commercial street, Atlantic avenue, Federal street, Kneeland street, Albany street, and the Boston & Albany Railroad to Washington street.

The Board of Survey District, commencing at the corner of Norfolk street and the New York & New England Railroad, is bounded by and includes the New York & New England Railroad, Morton street, Fairmount street, Milton avenue, Fuller street, Washington street, southerly line of South cemetery, Dorchester avenue, line opposite to St. Gregory's Church to Washington street, Washington street, Sanford street, Idaho street, River street, Washington street, Neponset river, and Norfolk street to the New York & New England Railroad.

City Proper District:

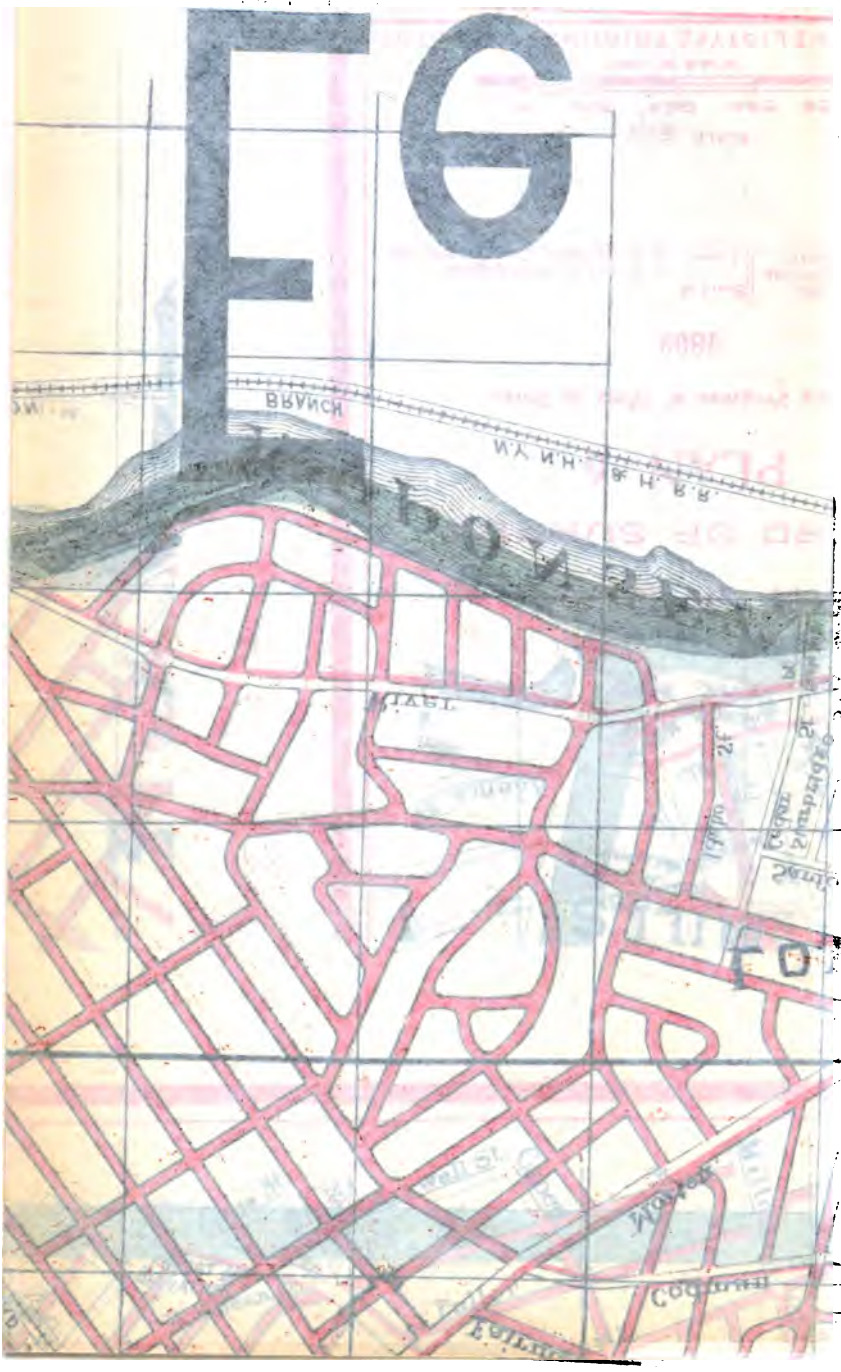
Area	503.43 acres
Length of streets . .	191,469 ft. = 36.26 miles
Area of streets .	8,533,210 sq. ft. = 195.90 acres

Percentage of area of district absorbed by streets, 38.9%

Board of Survey District:

Area	507.60 acres
Length of streets . .	114,210 ft. = 21.63 miles
Area of streets .	4,931,800 sq. ft. = 113.22 acres

Percentage of area of district absorbed by streets, 22.3%


Water
Coburn
BRANCH
R.R.
N.Y.N.H.
Q.J.

LOW TIDE IN SOUTH BAY — Plan 7.

PLAN 7.

SOUTH BAY.

This district, consisting of 1,332 acres of land and water, is bounded, approximately, by Dover street, West Fourth street, the Old Colony Division of the New York, New Haven, & Hartford Railroad, Old Harbor, Dudley, Hampden, and Albany streets. Of this area about 271 acres are flats, covered at flood tide with 10 feet of water, and at ebb tide left exposed. It is not an agreeable or very healthy locality at present, and will, for sanitary reasons alone, probably soon have to be filled in whole or in part. The redemption of this land may be accomplished very slowly, due to the natural reluctance of the owners and occupants of the wharves on the westerly side of the bay to leave their places of business; still, in time it may be filled solid to Dover-street bridge, and possibly to Federal street.

The Board has, therefore, with the approval of the largest owners in the territory, who have been shown the plan proposed, fitted it with a street system, part of which can be called into use for the occupation of buildings on the now filled portion and for wharves on the shore of whatever tide water may be left there, and a part consisting of such additional streets as would be needed, and which could be laid out and constructed when, if it shall be decided to fill the basin down to Dover-street bridge, either railroad terminals, manufacturing interests, or a residential population should seek to establish themselves on the territory.

This system is composed of the following thoroughfares and streets:

THOROUGHFARES.

For thoroughfares intersecting the district there are East Chester park, 75 feet wide; Swett street, 60 feet wide; and, for light pleasure travel, a parkway, 100 feet wide, projected by the Park Commissioners from East Chester park near its junction with Swett street, connecting the former with the boulevard along the Old Harbor front and the Marine park. Other thoroughfares are needed, however, and one 70 feet in width is projected, beginning at West Fourth street, where Foundry street now exists, running parallel with and 400 feet from the New York & New England Railroad, and uniting with Magazine street, making a fine, broad way through the middle of the territory. From Malden street, extended across the bay to the New York & New England Railroad, a street 60 feet wide running parallel with and 125

feet from the railroad connects with Clifton street at Dudley-street station, forming a most desirable thoroughfare. Dorchester avenue will be widened. Norfolk avenue is widened to 50 feet. Boston street will be made wider, as it is destined to be utilized for light driving to and from the parks. D street is an important street, fast becoming a thoroughfare, now ending at Dorchester avenue. Connecting with it here, a street of equal width is projected parallel with the New York & New England Railroad to East Chester park, thence, by an easy combination of straight lines and curves, continuing to Upham's Corner.

East Newton street is extended 60 feet in width to Swett street, opposite Magazine street, forming from this point a thoroughfare in almost a direct line across the city to Huntington avenue.

STREETS.

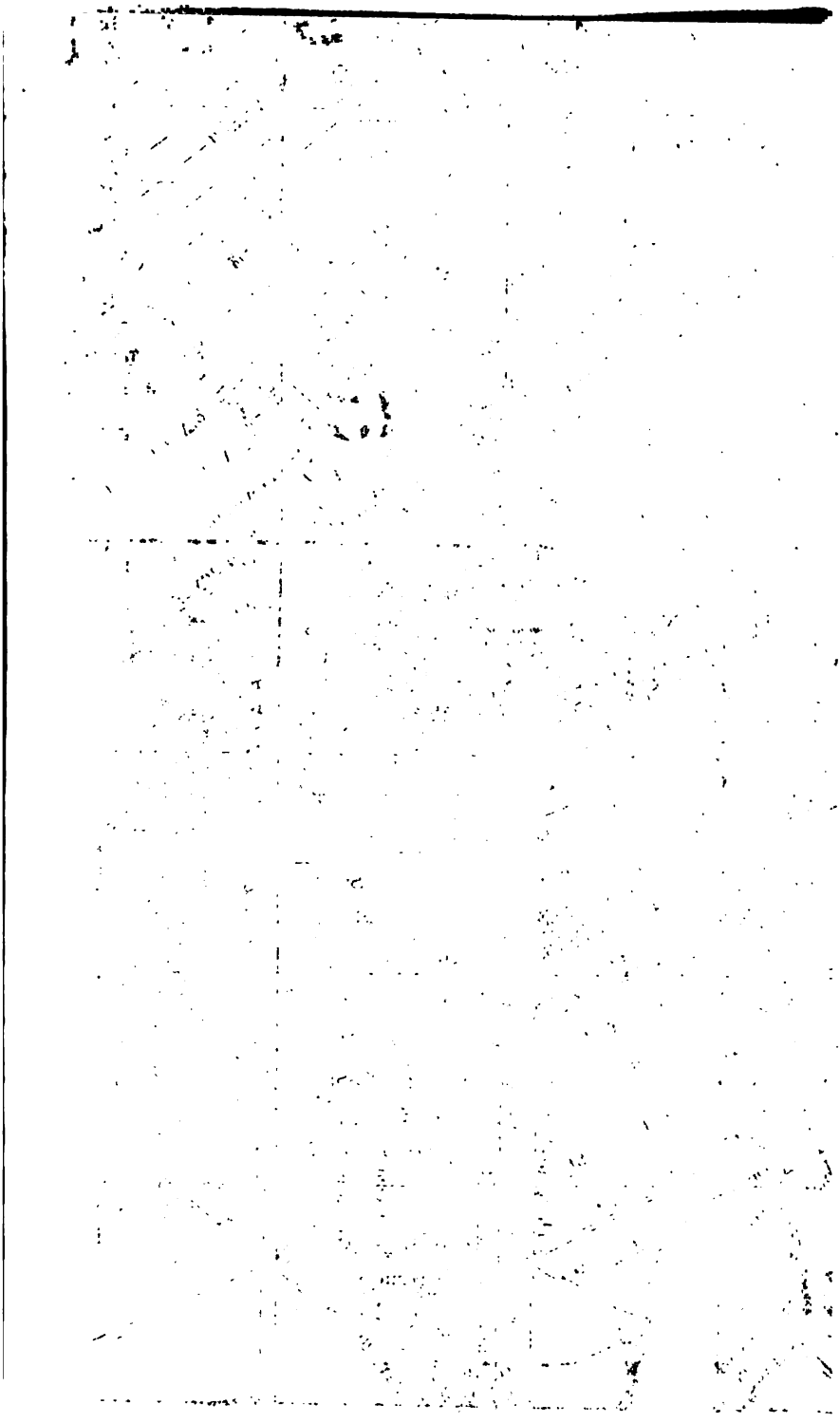
On the east or South Boston side of the railroad, B street is extended at its present width, and on a line parallel with the railroad, to East Chester park. With this as a base, a parallel rectangular block system of streets has been arranged to Swett street, with cross streets parallel with the latter; providing the proper allowance of land for lots. From East Chester park, south, an adaptation to and an enlargement of the existing arrangements, with a few modifications, has been carried out with good effect to Dudley street and to Hampden street. Between Albany street and the railroad there is another rectangular block system of parallel streets, the South End streets having been extended to meet a street parallel with Albany street, while another set of streets, commencing at the street which is parallel with the railroad, extends from it, parallel with Swett street, with widths varying from 50 feet to 60 feet.

The blocks are, with few exceptions, of good lengths, broken at intervals of, as nearly as possible, 600 feet.

The percentage of all streets in this territory, old and new, is 24.3%.

Appended is a plan of this territory, with a statement of the work:

Public streets:	
Number of streets	104
Length	158,176 ft.=29.95 miles
Private streets:	
Number of streets	72
Length	42,760 ft.=8.09 miles
Number of estates in Plan 7	3,417



G CO., BOSTON

Pentagraphing 20 Sectional Plans from size 3 ft. by 4 ft., scale, 40 ft. to an inch, to size 17½ in. by 23 in., scale, $\frac{1}{1000}$. (Completed.)

Preliminary Plan showing existing public and private streets, owners' names, etc.; size, 11 ft. by 10 ft.; scale, $\frac{1}{1000}$. (Completed.)

Plan from actual survey of territory bounded by West Fourth street, Dorchester avenue, East Chester park, and Albany street; size, 9 ft. by 5 ft.; scale, $\frac{1}{1000}$. (Completed.)

Plan from actual survey of the whole of the South bay; size, 15 ft. by 5 ft.; scale, $\frac{1}{1000}$. (In progress.)

Plan from actual survey of 20 sections, L 89, L 90, L 91, L 92, M 81, M 82, M 83, M 98, M 99, M 100, T 1, T 2, T 3, T 18, T 19, T 20, U 9, U 10, U 11, and U 12; size, 4 ft. by 4 ft.; scale, $\frac{1}{1000}$. (In progress.)

Plan from actual survey of 5 sections, L 89, L 90, M 81, M 82, and M 83; size, 10 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 5 sections, L 91, L 92, M 98, M 99, and M 100; size, 10 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 5 sections, T 1, T 2, T 3, U 9, and U 10; size, 10 ft. by 5 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 5 sections, T 18, T 19, T 20, U 11, and U 12; size, 10 ft. by 5 ft.; scale, $\frac{1}{250}$. (In progress.)

Ten Sectional Plans of sections, L 89, L 90, L 91, L 92, M 81, M 82, M 83, M 98, M 99, and M 100; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

In the territory of about 230 acres covered by the above sectional plans, there are comprised:

Public streets:

Number of streets	19
Length	13,760 ft.=2.61 miles
Area	823,820 sq. ft.=18.91 acres

New streets established, private streets adopted, and public streets widened by the Board of Survey:

Number of streets	31
Length	31,860 ft.=6.03 miles
Area	1,829,000 sq. ft.=41.99 acres

Parkway proposed to be established:

Length	700 ft.=0.132 mile
Area	98,850 sq. ft.=2.27 acres

Totals excluding Parkway:

Number of streets	50
Length	45,620 ft. = 8.64 miles
Area	2,652,820 sq. ft. = 60.90 acres
Percentage of area of above territory absorbed by all streets, old and new, excluding Parkway . .	26.52%

Grade plan of 10 sections, size, 9 ft. by 5 ft.; scale, $\frac{1}{1000}$. (In progress.)

In connection with the sectional and other plans enumerated above, the following work has been done:

Number of conveyances copied and titles looked up .	52
Number of plans copied from Suffolk Registry . .	25

PLAN 8.

BRIGHTON.

This plan includes the whole of that part of Boston known as Brighton, and contains about 2,800 acres.

This district has the advantage of Chestnut Hill Reservoir at its western end, with Commonwealth avenue leading up to it from the city. With a diversified surface and many natural advantages, it will be even more favored as a place of residence than at present, as it is fitted with proper systems of streets to develop and connect the various localities with the highways passing through the territory.

THOROUGHFARES.

North Beacon street, being the direct thoroughfare to Watertown, will be widened from Union square to the bridge. Washington and Cambridge streets, being the trunk lines of the district, encumbered as they are with electric car tracks, will be widened. Harvard avenue will also be widened. Faneuil street will be widened.

NEW THOROUGHFARES.

Sparhawk street it is intended to widen and extend through Arlington street to Faneuil street. Parsons street from its bend at Harriet street will be extended at its present width, north and nearly parallel with Market street, to North Beacon street. Foster street from Surrey street is extended to the junction of Faneuil and Parsons streets, and Surrey street is extended to connect with Oakland street.

The section of Brighton already considered in detail is bounded by Washington and Cambridge streets, Brighton avenue, and the town of Brookline. The Board have made a plan for the development of this part with a proper distribution of streets with practicable grades. Several hundred acres west of Market street and in the vicinity of Bigelow Hill are in progress of survey.

Percentage of area of territory considered, absorbed by all streets old and new, is 27.56%.

Appended is a plan of the territory and statement of the work:

Public streets:

Number of streets	97
Length	190,070 ft. = 35.99 miles

Private streets:

Number of streets	152
Length	91,180 ft. = 17.26 miles
Number of estates in Plan 8	1,526

Pentagraphing 20 Sectional Plans, belonging to City Engineer's Department, from size 2 ft. 4 in. by 3 ft. 4 in., scale, 100 ft. to an inch, to size 2 ft. 9.6 in. by 4 ft., scale, $\frac{1}{1000}$. (Completed.)

Preliminary Plan showing existing public and private streets, owners' names, etc., size, 20 ft. by 10 ft.; scale, $\frac{1}{1000}$. (Completed.)

Plan from actual survey of 3 sections, N 27, N 28, and N 29; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, N 30, O 21, and O 22; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 4 sections, N 31, N 32, N 33, and part of O 40; size, 16 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, N 11, N 12, and O 20; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, O 18 and O 19; size, 8 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 1 section, O 23; size, 4 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, O 39 and part of O 40; size, 8 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, N 49, N 50, and O 41; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, N 51, O 59, and O 60; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, O 42 and O 43; size, 8 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 2 sections, O 37 and O 38; size, 8 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 16 sections, N 11, N 12, N 27, N 28, N 29, N 30, N 31, N 32, N 33, O 18, O 19, O 20, O 21, O 22, O 23, and part of O 40; size, 18 ft. by 5 ft.; scale, $\frac{1}{1000}$. (Completed.)

Plan from actual survey of 12 sections, N 49, N 50, N 51, O 37, O 38, O 39, and part of O 40, O 41, O 42, O 43, O 59, and O 60; size, 6 ft. by 5 ft.; scale, $\frac{1}{1000}$. (Completed.)

Plan from actual survey of 18 sections, O 3, O 4, O 5, O 6, O 7, O 14, O 15, O 16, O 17, O 18, O 24, O 25, O 26, O 27, O 34, O 35, O 36, and O 37; size, 10 ft. by 5 ft.; scale, $\frac{1}{1000}$. (In progress.)

Seventeen Sectional Plans of sections N 27, N 28, N 29, N 30, N 31, N 32, N 33, N 50, N 51, O 21, O 38, O 39, O 40, O 41, O 42, O 43, and O 60; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

In the territory of about 319 acres covered by the above sectional plans, there are comprised:

Public streets:

Number of streets	13
Length	21,905 ft.=4.15 miles
Area	2,104,800 sq. ft.=48.32 acres

New streets established, private streets adopted, and public streets widened by the Board of Survey:

Number of streets	59
Length	41,615 ft.=7.88 miles
Area	1,779,075 sq. ft.=40.84 acres

Totals:

Number of streets	72
Length	63,520 ft.=12.03 miles
Area	3,883,875 sq. ft.=89.16 acres

Percentage of area of above territory absorbed by all streets, old and new 27.91%

Surveys are in progress and sectional plans are being prepared of territory covered by sections, N 11, N 12, O 18, O 19, O 20, O 22, and O 23; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$.

These plans will be ready for a second hearing about March 1, 1894.

In the territory of about 161 acres covered by the above sectional plans, there are comprised:

Public streets:

Number of streets	25
Length	20,275 ft.=3.84 miles
Area	993,325 sq. ft.=22.80 acres

New streets established, private streets adopted, and public streets widened by the Board of Survey:

Number of streets	37
Length	19,235 ft.=3.64 miles
Area	912,100 sq. ft.=20.94 acres

Totals:

Number of streets	62
Length	39,510 ft.=7.48 miles
Area	1,905,425 sq. ft.=43.74 acres

Percentage of area of above territory absorbed by all streets, old and new 27.22%

Surveys in detail are in progress for sectional plans of territory covered by 17 sections, O 3, O 4, O 5, O 6, O 7, O 14, O 15, O 16, O 17, O 24, O 25, O 26, O 27, O 34, O 35, O 36, and O 37, and the plans can be completed sufficiently for a second hearing about April 1, 1894.

In the territory of about 390 acres covered by the above sectional plans, there are comprised:

Public streets:	
Number of streets	34
Length	38,520 ft.=7.29 miles
Area	1,882,950 sq. ft.=43.22 acres
Private streets:	
Number of streets	27
Length	12,353 ft.=2.34 miles
Area	402,743 sq. ft.=9.25 acres

Grade Plan of 17 sections, size 12 ft. by 5 ft.; scale, $\frac{1}{1000}$. (In progress.)

Plans and Profiles showing grades of Warren and Mechanic streets, Harvard avenue, Quint street, Allston square, Cliffside street, Hollis place, Griggs street, Griggs place, Webster street, Webster avenue, Allston Heights, Ridgemont avenue, Sefton street, Gorham street, Holmes avenue, Summit avenue, Corey road, Washington street, Union street, Harvard avenue, and streets numbered 383, 384, 385, 389, 391, 392, 393, 394, 395, 397, 399, 403, 404, 410, 411, 413, 414, 415, 416, 417, 418, 419, 426, 427, 428, 429, 430, 431, 432, 433, 435, 436, 438, 439, 440, 441, 442, 443, 449, 451, and 452.

In connection with the sectional and other plans enumerated above, completed and in progress, the following work has been done:

Number of conveyances copied and titles looked up	160
Number of plans copied from Suffolk Registry	40

PLAN 9.

This is a comparatively small area containing 237 acres, and is enclosed on two sides by the Back Bay Fens and the Muddy River Improvement, while on its other borders are Huntington avenue and Tremont street. Being small, almost the entire territory has been considered in detail, and surveys and plans of it completed. There appears no necessity for more than the existing thoroughfares. Huntington avenue will be widened; 100 feet is thought the proper width for this street. Longwood avenue is a thoroughfare, and one of importance, as it is a cross-town street, connecting Roxbury with Brookline and Brighton via Longwood. It is widened to 60 feet. Francis street is widened. The portion of Brookline avenue included in this plan has been widened to 75 feet, to conform to the width of that portion of the avenue lying in the town of Brookline.

The lands situated between these various thoroughfares have been supplied with streets, to develop them for building purposes, which the Board believe will prove satisfactory to the owners and to the public using them for travel.

The percentage of area of the territory considered, absorbed by streets old and new, is 20.69%.

Appended is a plan of the territory and statement of the work done upon it:

Public streets:	
Number of streets	20
Length	41,095 ft.=7.78 miles
Private streets:	
Number of streets	9
Length	4,200 ft.=0.79 mile
Number of estates in Plan 9	202

Pentagraphing 10 Sectional Plans from size 3 ft. by 4 ft., scale, 40 ft. to an inch, to size 2 ft. 5.8 in. by 3 ft. 2.4 in.; scale, 50 ft. to an inch. (Completed.)

Preliminary Plan, showing existing public and private streets, owners' names, etc.; size, 8 ft. 6 in. by 7 ft.; scale, 50 ft. to an inch. (Completed.)

Plan from actual survey of 2 sections, N 59 and N 60; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 4 sections, M 70, N 61, N 62, and N 63; size, 18 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, N 78, N 79, and N 80; size, 14 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Plan from actual survey of 3 sections, N 81, N 82, and N 83; size, 14 ft. by 5 ft.; scale, $\frac{1}{250}$. (Completed.)

Three Sectional Plans of sections N 61, N 79, and N 80, complete with grades; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$.

These plans were approved by the Mayor, and filed December 30, 1893, with the City Surveyor.

Seven Sectional Plans of sections N 59, N 60, N 62, N 63, N 78, N 83, and M 70, complete with grades; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$.

These plans were approved by the Mayor, and filed January 3, 1894, with the City Surveyor.

In the territory of about 135.88 acres covered by the above sectional plans there are comprised:

Public streets:	
Number of streets	8
Length	34,565 ft.=6.54 miles
Area	501,660 sq. ft.=11.51 acres
New streets established, private streets adopted, and public streets widened by the Board of Survey:	
Number of streets	24
Length	21,308 ft.=4.03 miles
Area	1,116,070 sq. ft.=25.62 acres
Totals:	
Number of streets	32
Length	55,873 ft.=10.57 miles
Area	1,617,730 sq. ft.=37.13 acres
Percentage of area of above territory absorbed by all streets, old and new	27.32%

Grade Plan of 12 sections; size, 6 ft. by 5 ft.; scale, $\frac{1}{1000}$. (Completed.)

Two Sectional Plans of sections N 81, and N 82 complete with grades; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{250}$. (Completed, but not yet filed.)

In the territory of about 46 acres covered by the above sectional plans, there are comprised:

Public streets:	
Number of streets	11
Length	6,090 ft.=1.15 mile
Area	343,700 sq. ft.=7.89 acres
New streets established, private streets adopted, and public streets widened by the Board of Survey:	

Number of streets	9
Length	5,180 ft.=0.98 mile
Area	161,600 sq. ft.=3.71 acres
Totals:	
Number of streets	20
Length	11,270 ft.=2.13 miles
Area	505,300 sq. ft.=11.60 acres
Percentage of area of above territory absorbed by all streets, old and new	25.2%

Plans and Profiles showing grades of Vila, Francis, Bernier, Austin, Short, Plymouth, Bellevue, and Peabody streets, and Longwood avenue, and streets numbered 216, 217, 218, 274, 275, 276, 277, 278, 279, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 355, and 363.

In connection with the sectional and other plans enumerated above, the following work has been done:

Number of conveyances copied and titles looked up	115
Number of plans copied from Suffolk and Norfolk Registries	32

PLAN 10.

This territory is bounded by the towns of Hyde Park and Dedham, the West Roxbury Branch Railroad, and Ashland street, and contains 2,373 acres. The village of Roslindale is located principally in this district. It is well provided with a local system of streets.

The balance of the territory is principally undeveloped, containing the Muddy Pond Woods, a densely wooded and picturesque area stretching over the border into the town of Hyde Park. The most needed thoroughfares in this region are to connect the West Roxbury villages with Hyde Park. The only one now existing is an extremely circuitous and lengthy route.

A large force has been engaged in the field since late last summer on detailed surveys for the location of streets, but as the system here undertaken depends on the location and extent of the tract of land to be taken by the Metropolitan Park Commissioners for a park in Muddy Pond Woods, and also on the location, by the Park Commissioners of the City of Boston, of a proposed parkway from Arnold Arboretum to the Muddy Pond Park, the work has been somewhat delayed in this territory.

Southwest of LaGrange street numerous studies have been made and a hearing will soon be given upon them.

Appended is a plan of the territory and statement of the work:

Public streets:	
Number of streets	48
Length	7,860 ft. = 1.48 mile
Private streets:	
Number of streets	129
Length	11,520 ft. = 2.18 miles
Number of estates in Plan 10	1,892

Pentagraphing 22 Sectional Plans from size 3 ft. by 4 ft., scale, 60 ft. to an inch, to size 2 ft. 1.5 in. by 2 ft. 10.5 in., scale, $\frac{1}{1000}$. (Completed.)

Preliminary Plan showing existing public and private streets, owners' names, etc.; size, 17 ft. by 10 ft.; scale, $\frac{1}{1000}$. (Completed.)

Plan from actual survey of 2 sections, Z 86 and Z 95; size, 8 ft. by 5 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Cc 6 and Cc 15; size, 8 ft. by 5 ft.; scale, $\frac{1}{250}$. (In progress.)

VIEW IN WEST ROXBURY — Plan 10.

Plan from actual survey of 3 sections, Cc 26, Cc 35, and Cc 46; size, 12 ft. by 5 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Z 94 and Cc 7; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Cc 14 and Cc 27; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Z 96 and Cc 5; size, 8 ft. by 5 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Cc 16 and Cc 25; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Cc 36 and Cc 45; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Cc 4 and Cc 17; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Cc 24 and Cc 37; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, a part of Cc 3, and Cc 18, size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 1 section, Cc 34; size, 4 ft. by 5 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Z 84 and Z 97; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Z 83 and Z 98; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Cc 2 and part of Cc 3; size 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Z 81 and Z 100; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Z 79 and Z 80; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 2 sections, Z 61 and Z 62; size, 8 ft. by 4 ft.; scale, $\frac{1}{250}$. (In progress.)

Plan from actual survey of 19 sections, Z 61, Z 62, Z 63, Z 64, Z 76, Z 77, Z 78, Z 79, Z 80, Z 81, Z 82, Z 83, Z 84, Z 85, Z 97, Z 98, Z 99, Z 100, and Cc 2; size, 6 ft. by 5 ft.; scale, $\frac{1}{1000}$. (Completed.)

Twenty-six Sectional Plans of sections Cc 3, Cc 4, Cc 5, Cc 6, Cc 7, Cc 14, Cc 15, Cc 16, Cc 17, Cc 18, Cc 19, Cc 23, Cc 24, Cc 25, Cc 26, Cc 27, Cc 34, Cc 35, Cc 36, Cc 37, Cc 45, Cc 46, Z 86, Z 94, Z 95, and Z 96 are in progress and ready for a second hearing.

In the territory of about 527 acres covered by the above sectional plans, there are comprised:

Public streets
Number 12
Length . . . . . 22,545 ft.=4.27 miles
Area . . . . . 1,074,500 sq. ft.=24.66 acres
New streets established, private streets adopted, and public streets widened by the Board of Survey:
Number of streets 59
Length . . . . . 78,410 ft.=14.85 miles
Area . . . . . 3,683,100 sq. ft.=84.55 acres
Totals:
Number 71
Length . . . . . 100,955 ft.=19.12 miles
Area . . . . . 4,757,600 sq. ft.=109.21 acres
Percentage of area of above territory absorbed by all streets, old and new 20.2%

Nineteen Sectional Plans of sections Z 61, Z 62, Z 63, Z 64, Z 76, Z 77, Z 78, Z 79, Z 80, Z 81, Z 82, Z 83, Z 84, Z 85, Z 97, Z 98, Z 99, Z 100, and Cc 2; size of each, 4 ft. by 4 ft.; scale, $\frac{1}{240}$.

These plans will be ready for a second hearing, February 1, 1894.

This date is contingent on the decision of the Park Commissioners regarding the Parkway.

In the territory of about 427.44 acres covered by the above sectional plans, there are comprised:

Public streets:
Number 13
Length . . . . . 22,820 ft.=4.322 miles
Area . . . . . 962,340 sq. ft.=22.092 acres
New streets established, private streets adopted, and public streets widened by the Board of Survey:
Number 74
Length . . . . . 71,640 ft.=13.568 miles
Area . . . . . 2,983,695 sq. ft.=68,496 acres
Totals:
Number 87
Length . . . . . 94,460 ft.=17.89 miles
Area . . . . . 3,946,035 sq. ft.=90.588 acres
Percentage of area of above territory absorbed by all streets, old and new 21.19%

In connection with the sectional and other plans enumerated above, the following work has been done:

Number of conveyances copied and titles looked up . 315
Number of plans copied from Suffolk and Norfolk Registries 35

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30

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PLAN 11.

This plan covers 2,332 acres and is bounded practically by Allandale and Centre streets, the Arnold Arboretum, the West Roxbury Branch Railroad, the town of Dedham, the city of Newton, and the town of Brookline. The land is well elevated, sloping gradually from the Newton line toward the railroad, and is a desirable place for residences. The portion of this territory the farthest from the railroads will need thoroughfares to bring it into better communication with other sections of the city and Newton and Dedham.

Appended is a plan of the territory, with statement of the work upon it:

Public streets:	
Number of streets	30
Length	8,070 ft.=1.52 mile
Private streets:	
Number of streets	54
Length	6,240 ft.=1.18 mile
Number of estates in Plan 11	599

Pentagraphing 19 Sectional Plans from size 3 ft. by 4 ft., scale, 60 ft. to an inch, to size 2 ft. 1.5 in. by 2 ft. 10.5 in., scale, $\frac{1}{1000}$. (Completed.)

Pentagraphing 15 Miscellaneous Plans from various scales to scale $\frac{1}{1000}$.

Tracings made of 10 Plans, size, 3 ft. by 3 ft., for pentagraphing to scale $\frac{1}{1000}$.

Preliminary Plan, showing existing public and private streets, owners' names, etc.; size, 20 ft. by 10 ft.; scale, $\frac{1}{1000}$. (Completed.)

PLAN 12.

This plan shows 2,374 acres, bounded practically by the town of Brookline, Prince, Pond, Eliot, and South streets, Carolina avenue, Williams street, Franklin park, Blue Hill avenue, the town of Hyde Park, Ashland street, the West Roxbury Branch Railroad, and Bussey, Walter, Centre, and Allandale streets. Much of the land is situated at a fine elevation, some of it being the most desirable for residences to be found within the limits of the city. It offers excellent opportunities for treatment to advantage for both owners and the public. A preliminary hearing only has been held on this tract, and that but recently. As soon as possible it will be taken into consideration in detail, for streets, thoroughfares, etc.

Appended is a plan of this territory, and statement of the work upon it:

Public streets:	
Number of streets	53
Length	13,505 ft. = 2.55 miles
Private streets:	
Number of streets	44
Length	3,220 ft. = 0.61 mile
Number of estates in Plan 12	1,166

Pentagraphing 28 Sectional Plans from size 3 ft. by 4 ft., scales, 40 and 60 ft. to an inch, to size 2 ft. 1.5 in. by 2 ft. 10.5 in., scale, $\frac{1}{1000}$. (Completed.)

Pentagraphing 12 Tracings, size, 3 ft. by 2 ft., scale, 100 ft. to an inch, to scale $\frac{1}{1000}$. (Completed.)

Pentagraphing 10 Miscellaneous Plans of various sizes and scales, to scale $\frac{1}{1000}$.

Tracings made of 12 Plans, size, 3 ft. by 2 ft., for pentagraphing to scale $\frac{1}{1000}$.

Preliminary Plan showing existing public and private streets, owners' names, etc.; size, 18 ft. by 10 ft.; scale, $\frac{1}{1000}$. (Completed.)

Preliminary work done upon territory outside of the foregoing plans:

Plans and Profiles showing grades of A, B, C, D, E, and F streets, and Wales and Olney-street places; scales, $\frac{1}{250}$ and $\frac{1}{50}$. (Completed.)

Plans and Profiles showing revised grades of Olney and Richmond streets and Geneva and Puritan avenues; scales, $\frac{1}{250}$ and $\frac{1}{50}$. (Completed.)

1
4 ft.
ch.

SUMMARY OF DETAIL OF WORK UPON FOREGOING PLANS.

Plans:
Numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12.

Area, 16,383.75 acres.

Public streets:
Number of streets 574
Length . . . . . 757,151 ft.=143.40 miles
Private streets:
Number of streets 787
Length . . . . . 391,341 ft.=74.12 miles
Estates:
Number of estates 16,067
Working plans completed:
Number 1
Size . . . . . 16 ft. by 7 ft.
Scale . . . . . 50 ft. to an inch
The only working plan made was for the "Plan 4" mentioned above.
Tracings made for pentagraphing:
Number 82
Size of each . . . . 1 ft. 9 in. by 2 ft. 8 in.
Scales . . . . 100, 150, and 200 ft. to an inch
Pentagraphed sectional plans completed:
Number 237
Sizes, 3 ft. by 4 ft.; 2 ft. 4 in. by 3 ft. 4 in.; pentagraphed to sizes 17½ in. by 23 in.; 2 ft. 5.8 in. by 3 ft. 2.4 in.; and 2 ft. 9.6 in. by 4 ft.; scales, 40 and 100 ft. to an inch, pentagraphed to scales $\frac{1}{1000}$ and 50 ft. to an inch.
Preliminary plans completed:
Number 12
Sizes, 11 ft. 6 in. by 8 ft. 9 in.; 12 ft. 3 in. by 5 ft.; 14 ft. by 10 ft.; 16 ft. 6 in. by 10 ft.; 10 ft. by 8 ft.; 9 ft. by 5 ft.; 11 ft. by 10 ft.; 20 ft. by 10 ft.; 8 ft. 6 in. by 7 ft; 17 ft. by 10 ft.; 20 ft. by 10 ft.; and 18 ft. by 10 ft.; scales, 50 ft. to an inch and $\frac{1}{1000}$.
Preliminary plans in progress:
Number 1
Size . . . . . 21 ft. by 10 ft.
Scale . . . . . $\frac{1}{1000}$
Tracings of sectional plans for field work:
Number 71
Size . . . . . 3 ft. by 4 ft.
Scales . . . . 20, 40, and 60 ft. to an inch.

Plans from actual survey completed:

Number	54
Number of sections comprised	154
Area of sections comprised	2,706 acres
Scale	$\frac{1}{250}$

Plans from actual survey, completed, of territory:

Number	3
Number of sections comprised	59
Area of sections comprised	1,285 acres
Scale	$\frac{1}{1000}$

Plans from actual survey in progress:

Number	20
Number of sections comprised	46
Area of sections comprised	964 acres
Scale	$\frac{1}{250}$

Plan from actual survey in progress, of territory:

Number	2
Number of sections comprised	38
Area of sections comprised	873 acres
Scale	$\frac{1}{1000}$

Sectional plans completed, approved, and filed:

Number of plans	94
Size of each	4 ft. by 4 ft.
Scale	$\frac{1}{250}$

Territory covered by plans:

Area	1,523.48 acres

Public streets:

Number of streets	73
Length	103,779 ft.=19.65 miles
Area	4,943,850 sq. ft.=113.50 acres

New streets established, private streets adopted, and public streets widened by the Board of Survey:

Number of streets	275
Length	233,218 ft.=44.17 miles
Area	11,975,735 sq. ft.=274.93 acres

Sectional plans completed, ready to file:

Number of plans	12
Size of each	4 ft. by 4 ft.
Scale	$\frac{1}{250}$

Territory covered by plans:

Area	216.73 acres

Public streets:

Number of streets	31
Length	24,535 ft.=4.65 miles
Area	1,327,862 sq. ft.=30.48 acres

New streets established, private streets adopted, and public streets widened by the Board of Survey:

DALE STREET, WEST ROXBURY, NEAR HYDE PARK LINE.

Number of streets 54
Length . . . . . 28,331 ft.=5.37 miles
Area . . . . . 1,256,440 sq. ft.=28.84 acres
Sectional plans to be ready for second hearing:
Number of plans 69
Size of each . . . . . 4 ft. by 4 ft.
Scale . . . . . $\frac{1}{250}$
Territory covered by plans:
Area . . . . . 1,505.44 acres
Public streets:
Number of streets 84
Length . . . . . 104,160 ft.=19.72 miles
Area . . . . . 4,913,115 sq. ft.=112.78 acres
New streets established, private streets adopted, and public streets widened by the Board of Survey:
Number of streets 260
Length . . . . . 216,200 ft.=40.94 miles
Area . . . . . 9,787,387 sq. ft.=224.68 acres
Sectional plans in progress:
Number of plans 37
Size of each . . . . . 4 ft. by 4 ft.
Scale . . . . . $\frac{1}{250}$
Territory covered by plans:
Area . . . . . 728 acres
Public streets:
Number of streets 41
Length . . . . . 41,956 ft.=7.95 miles
Area . . . . . 3,219,851 sq. ft.=73.91 acres
New streets established, private streets adopted, and public streets widened by the Board of Survey:
Number of streets 134
Length . . . . . 104,733 ft.=19.83 miles
Area . . . . . 5,225,432 sq. ft.=119.96 acres
Totals of sectional plans filed, ready to file, to be ready for second hearing, and in progress:
Number of plans 212
Size of each . . . . . 4 ft. by 4 ft.
Scale . . . . . $\frac{1}{250}$
Territory covered by plans:
Area . . . . . 3,973.65 acres
Public streets:
Number of streets 229
Length . . . . . 274,430 ft.=51.97 miles
Area . . . . . 14,404,678 sq. ft.=330.68 acres
New streets established, private streets adopted, and public streets widened by the Board of Survey:
Number of streets 723

Length . . . . . 582,482 ft.=110.31 miles
Area . . . . 28,244,994 sq. ft.=648.41 acres
Percentage of area of above territory absorbed by all streets, old and new 24.64%
Streets located and relocated on sectional plans completed, approved, and filed:
Length . . . . . 336,997 ft.=63.83 miles
Streets located and relocated on sectional plans completed, ready to file:
Length . . . . . 52,866 ft.=10.01 miles
Streets located and relocated on sectional plans ready for second hearing:
Length . . . . . 320,360 ft.=60.67 miles
Streets located and relocated on sectional plans in progress:
Length . . . . . 146,689 ft.=27.78 miles
Total of streets located and relocated on sectional plans filed, ready to file, to be ready for second hearing, and in progress:
Length . . . . . 856,912 ft.=162.29 miles
Index plans completed:
Number of plans 2
Size . . . . . 4 ft. by 4 ft.
Scales . . . . . $\frac{1}{1000}$ and $\frac{1}{1600}$
Grade plans of whole territories completed:
Number of plans 2
Number of sections comprised 25
Area of sections comprised . . 237.75 acres
Scale . . . . . $\frac{1}{1000}$
Copies of grade plans of whole territories completed:
Number of plans 1
Number of sections comprised 12
Area of sections comprised . . . 105 acres
Scale . . . . . $\frac{1}{1000}$
Grade plan of whole territory in progress:
Number of plans 1
Number of sections comprised 80
Area of sections comprised . . . 551 acres
Scale . . . . . $\frac{1}{1000}$
Grade plans of sections completed:
Number of plans 4
Number of sections comprised 75
Area of sections comprised . . . 1,457 acres
Scale . . . . . $\frac{1}{1000}$
Grade plans of sections in progress:
Number of plans 3
Number of sections comprised 41

VIEW IN WEST ROXBURY — Plan 12.

Area of sections comprised . . . . 820 acres
Scale . . . . . $\frac{1}{1000}$

Plans and Profiles showing grades completed:
Number of streets comprised 342
Scales . . . . . $\frac{1}{250}$ and $\frac{1}{50}$

Plans and Profiles showing grades (in progress):
Number of streets comprised 62
Scales . . . . . $\frac{1}{250}$ and $\frac{1}{50}$

Plans and Profiles showing grades and proposed lines of widening, for use of the Street Commissioners, completed:
Number of streets comprised 3
Scales . . 150 ft. to an inch, $\frac{1}{250}$, 10 ft. to an inch, $\frac{1}{50}$

Plans showing contours at every five feet completed:
Number of plans 1
Number of sections comprised 35
Area of sections comprised . . . . . 805 acres
Scale . . . . . $\frac{1}{1000}$

Tracings showing contours at every five feet completed:
Number of tracings 2
Number of sections comprised 42
Area of sections comprised . . . . . 966 acres
Scale . . . . . $\frac{1}{1000}$

Plans showing contours at every foot completed:
Number of plans 8
Number of sections comprised 37
Area of sections comprised . . . . 851 acres
Scale . . . . . $\frac{1}{250}$

Estimates for filing completed:
Number of streets comprised 26
Number of parcels of land outside of the streets . 238

Conveyances copied and titles looked up:
Number 3,787

Plans copied from Suffolk Registry:
Number 1,135

Miscellaneous plans completed:
Number 42

Miscellaneous plans pentagraphed:
Number 125

Miscellaneous plans traced:
Number 180

Miscellaneous plans copied:
Number 240

Blue-prints made:
Number 190

Stone monuments set in districts covered by Plans 1, 2, 3,

4, 5, 9, and 10, for use in determination of position and location of street lines:

Number of monuments 84

Miscellaneous Work: includes tracings, estimates of areas by calculations, planimeter, etc., sketches and studies of different plats, copies of city's notes for use in the field, etc.

MEDWAY STREET, DORCHESTER, ON LINE OF PROPOSED BOULEVARD.

TRIANGULATION.

The following is an account of the triangulation of the city of Boston that has been accomplished under the direction of the Board.

The primary bases for this triangulation were obtained from Appendix No. 8, Coast and Geodetic Survey Report for 1885.

The points used and their geodetic positions are as follows:

Name of Station.	Latitude.	Longitude.
	° ′ ″	° ′ ″
Prospect, Waltham	42-23-18.831	71-15-15.333
Cambridge Observatory, centre of dome, telegraphic longitude station, 1851 and 1872	42-22-53.490	71-07-43.885
Boston State House (C. & G. S. & B.)	42-21-29.596	71-03-51.040
Blind Asylum	42-20-07.037	71-02-32.861
Blue Hill, astronomical azimuth station, 1845	42-12-43.941	71-06-52.638
Powderhorn 2, 1877	42-24-04.564	71-01-52.055

The bases were computed by inverse solutions of the "Latitude, Meridian, and Azimuth" formulæ. See Clarke's formulæ, Appendix No. 7, Report for 1884, United States Coast and Geodetic Survey.

From State House to	Distance. Metres.	Log. Metres.	Distance. Feet.	Log. Feet.
Prospect, Waltham	16015.11	4.2045299	52543.48	4.7205188
Cambridge Observatory	5923.29	3.7725628	19433.53	4.2885517
Blind Asylum	3113.08	3.4931908	10213.62	4.0091797
Blue Hill	16744.16	4.2238634	54935.41	4.7398523
Powderhorn 2	5502.11	3.7405295	18051.71	4.2565184

A system of rectangular coördinates was adopted, the zero of which is 50,000 feet south and 50,000 feet east of the geodetic position of the State House.

In other words, the geodetic position of the State House was assumed 50,000 feet north and 50,000 feet west of this zero. This value was assumed to avoid any minus positions, only four of which occur in the system, viz.:

Blue Hill, astronomical azimuth station, 1845.
Blue Hill, Borden, triangle let into floor inside of tower.
Blue Hill pole, flagstaff on top of tower.
Blue Hill tower, centre of tower.

The geodetic position of the State House was assumed as the initial point of the system, and the geodetic azimuth and bases obtained from inverse solutions of the L. M. Z. or Clarke's formulæ were used to establish the coördinate position of the following points:

Name of Station.	North. Feet.	West. Feet.
Prospect, Waltham	61115.46	101354.29
Cambridge Observatory	58499.41	67476.33
Blind Asylum	41643.17	44127.93
Blue Hill	—3208.32	63666.51

From these coördinate positions were obtained the following azimuths and bases:

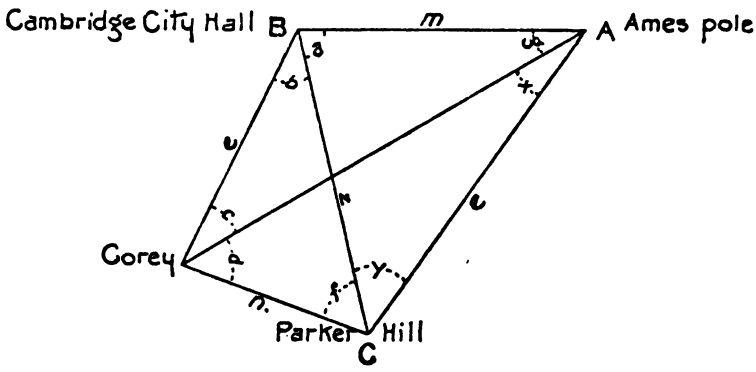
From	To	Azimuth. From State House Meridian.	Distance. Feet.	Log. Feet.
		° ′ ″		
Prospect, Waltham,	Cambridge Obs.	274–24–56.18	33978.82	4.5312083
" "	Blind Asylum	288–47–30.45	60448.54	4.7813858
" "	[1] Blue Hill	329–38–01.10	74551.43	4.8724560
Cambridge Obs.	Blind Asylum	305–49–37.86	28797.23	4.4593507
" "	[1] Blue Hill	356–28–01.40	61825.23	4.7911657
Blind Asylum	[1] Blue Hill	23–32–21.50	48922.52	4.6895088

[1] Astronomical Azimuth Station, 1845.

The position of Parker Hill, Ames, and Ames pole were

then established, and the base, Parker Hill to Ames pole, used in the "two-point" problem, following, to obtain the position of Cambridge City Hall and Corey. This formula was obtained from the Massachusetts Topographical Survey, with the information that it appeared in the manuscript report of Mr. James Main, of the United States Coast and Geodetic Survey, in 1877. The formula and its application is here shown.

TWO-POINT PROBLEM.



Given ∠s a, b, c, d, and side e:

$$\frac{e'}{e} = \frac{e'}{m} \times \frac{m}{e} = \frac{\sin.\ (a+b+c)\ \sin.\ y}{\sin.\ c\ \ \sin.\ a} \quad . \quad . \quad . \quad . \quad 1.$$

$$\frac{e'}{e} = \frac{e'}{n} \times \frac{n}{e} \quad \frac{\sin.\ (b+c+d)\ \sin.\ x}{\sin.\ b\ \ \sin.\ d} \quad . \quad . \quad . \quad . \quad 2.$$

$$\therefore \quad \frac{\sin.\ y}{\sin.\ x} = \frac{\sin.\ a\ \ \sin.\ c\ \ \sin.\ (b+c+d)}{\sin.\ b\ \ \sin.\ d\ \ \sin.\ (a+b+c)} = \tan.\ \Phi.$$

$$\therefore \quad \frac{\sin.\ y - \sin.\ x}{\sin.\ y + \sin.\ x} = \frac{\tan.\ \Phi - 1}{\tan.\ \Phi + 1}.$$

$$\text{or } \frac{\tan.\ \frac{1}{2}\ (y-x)}{\tan.\ \frac{1}{2}\ (y+x)} = \tan.\ (\Phi - 45^\circ).$$

$$\text{but } \tfrac{1}{2}\ (y+x) = \tfrac{1}{2}\ (b+c).$$

$$\therefore\ \tfrac{1}{2}\ (y-x) = \tan.\ \tfrac{1}{2}\ (b+c)\ \tan.\ (\Phi - 45^\circ).$$

$a = 78^\circ\ 21'\ 54''.56$	$b+c+d = 123^\circ\ 45'\ 26''.43$
$b = 37^\circ\ 44'\ 57''.50$	$a+b+c = 150^\circ\ 41'\ 20''.73$
$c = 34^\circ\ 34'\ 28''.67$	$\frac{1}{2}\ (b+c) = 36^\circ\ 09'\ 43''.08$
$d = 51^\circ\ 26'\ 00''.26$	. $\log.\ e = 4.2321670$

	log. sin. a	9.9909835	tan. ½ (b + c)	9.8638404
	log. sin. c	9.7539499	tan. (Φ—45°)	9.5146159
	log. sin. (b + c + d)	9.9198092	tan. ½ (y—x)	9.3784563
co. log.	sin. d	0.1068577	½ (y—x)	13° 26′ 35″.83
	sin. b	0.2131012	½ (y + x)	36° 09′ 43″.08
	sin. (a + b + c)	0.3102043	x	22° 43′ 07″.25
	tan. Φ	0.2949058	y	49° 36′ 18″.91
	Φ	63° 06′ 37″.45		
	log. e	4.2321670	log. e	4.2321670
	sin. (a + b + c)	9.6897957	sin. (b + c + d)	9.9198092
	sin. y	9.8817257	sin. x	9.5868199
	co. log. sin. c	0.2460501	co. log. sin. b	0.2131012
	co. log. sin. a	0.0090165	co. log. sin. d	0.1068577
	e′	4.0587550	e′	4.0587550

ANOTHER SOLUTION.

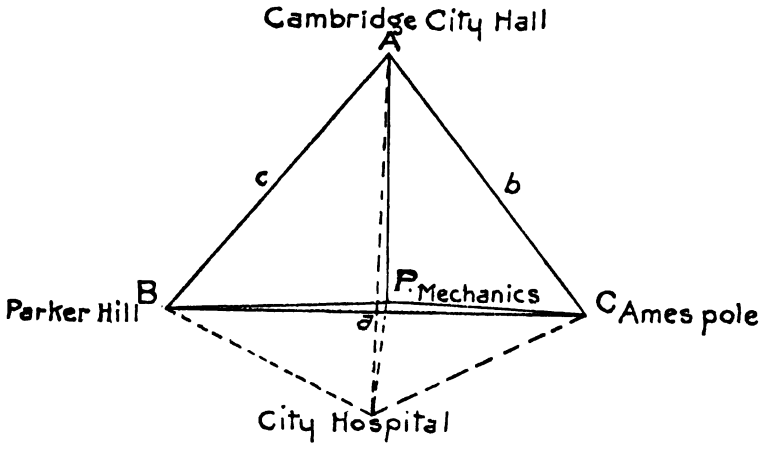
Assuming the length of the side e′ as unity, the angles and sides of the quadrilateral may be computed as follows:

$180° - (b + c + d) = f$ $\qquad$ $180° - (a + b + c) = g.$

$\sin. f : \sin. (c + d) :: 1 : z$ $\qquad$ $\sin. g : \sin. c :: 1 : m.$

which gives two sides and the included angle of the triangle A B C, from which we can find the angles y and (g + x) and their sides in their relation to e′ as unity.

THREE-POINT PROBLEM.



The "three-point" problem has been employed very satisfactorily in the determination of positions; two independent

WEST SELDEN STREET — Plan 6.

solutions were always worked and frequently three and four. Reference is here made to Appendix No. 9, Report for 1882 of the United States Coast and Geodetic Survey, for a more comprehensive exemplification of the problem.

One example of its application is appended:

Given the sides a, b, and c.
Given the angles A. B. and C.
Observed angles A. P. C. and A. P. B.

To find A. B. P. = x	A P C = P′
To find A. C. P. = y	A P B = P″
Azimuth C. C. H. to P. H.	1° 17′ 21″.03
Azimuth C. C. H. to Ames pole	228° 55′ 26″.57
Angle at A = ...	78° 21′ 54″.46

$$\tan. Z = \frac{c \sin. P'}{b \sin. P''} \quad \varepsilon = \tfrac{1}{2}(x - y) \quad \tan. \varepsilon = \cot (Z + 45^\circ) \tan. S.$$

$x = S + \varepsilon$.
$y = S - \varepsilon$, but if tan. ε be negative, then $x = S - \varepsilon$ and $y = S + \varepsilon$.
$S = 180^\circ - \tfrac{1}{2}(A + P' + P'')$.

log. c	4.1229092	A =	78° 21′ 54″.46
sin. P′	9.9997980	P′ =	91° 44′ 50″.62
co. log. b	5.8621092	P″ =	92° 55′ 53″.23
log. co. sin. P″	0.0005687		2)263° 02′ 38″.31
tan. Z	9.9853851		131° 31′ 19″.15
Z	44–02–10.05		180°
log. cot. (z + 45°)	8.2259390	S =	48° 28′ 40″.85
log. tan. S	0.0528558		
log. tan. ε	8.2787948		
ε	1° 05′ 18″.93		
S	48° 28′ 40″.85		
x	49° 33′ 59″.78		
y	47° 23′ 21″.92		

Ames pole to Cambridge City Hall . .		4.1229092
Mechanics	92° 55′ 53″.23	0.0005687
Ames pole	49° 33′ 59″.78	9.8814762
Cambridge City Hall . .	37° 30′ 06″.99	9.7844663
Mechanics to Cambridge City Hall . .		4.0049541
Mechanics to Ames pole		3.9079442

Parker Hill to Cambridge City Hall . .		4.1378908
Mechanics	91° 44′ 50″.62	0.0002020
Parker Hill . . .	47° 23′ 21″.92	9.8668613
Cambridge City Hall . .	40° 51′ 47″.46	9.8157420
Mechanics to Cambridge City Hall . .		4.0049541
Mechanics to Parker Hill		3.9538348

Azimuth Cambridge City Hall to Ames pole, 282° 55′ 26″.57
Angle at Cambridge City Hall, Ames pole to
Mechanics . . . . . 37° 30′ 06″.99
Azimuth Cambridge City Hall to Mechanics 320° 25′ 33″.56

9.8869430	sin. 320° 25′ 33″.56	Cos 9.8041902
4.0049541	Mechanics to Cambridge City Hall,	4.0049541
3.8918971		3.8091443
7796.45		6443.83
53246.49	Cambridge City Hall,	61364.12
45450.04	Mechanics	54920.29

This presents one of the four solutions worked.
The four results and their mean are:

From	North — Feet.	West — Feet.
Cambridge City Hall, Ames pole, Parker Hill	45450.04	54920.29
Parker Hill, Ames pole, City Hospital.....	45450.02	54920.31
Cambridge City Hall, Ames pole, City Hospital....	45450.04	54920.32
City Hospital, Parker Hill, Cambridge City Hall...	45450.00	54920.29
	4).10	4)1.21
Mean position of Mechanics.....	45450.02	54920.30

When the several determinations of the coördinate positions have approximated closely, the final result has been obtained by using the arithmetical mean instead of the process of least squares. The results showing no appreciable difference.

The angles observed for fixing coördinate positions were read twenty-four times or more: twelve direct and twelve reverse, turning from left to right.

By the terms "direct" and "reverse" are meant:

Direct: turning from left to right with the telescope in its ordinary position (with level bubble below telescope).

Reverse: reversing the telescope and repeating the operation.

This was done for the purpose of correcting any error in the line of collimation.

The readings were taken by the continuous method to avoid errors of graduation.

First setting the plates at zero, sighting to left-hand signal, and clamping the lower motion; releasing the upper motion and turning to right-hand signal and clamping.

This angle was read and called the rough angle, or 1, as it appears in the form here shown; the lower motion was then released, telescope turned back to left-hand signal, and the operation repeated with the exception that no more readings were taken until the sixth angle had been turned. Readings of both verniers were recorded.

AT WATER-TOWER, DECEMBER 16, 1892.

Station.	Time.	D. R.	Rps.	A.	B.	Mean of Verniers.	Angles.	Mean of D. and R.	Remarks.
				° ′ ″	° ′ ″				
Blind Asylum .	9.30			360-00-00	180-00-00				Clear and cold.
Parker Hill . .			1	129-42-40		′ ″	° ′ ″		
		D	6	58-16-30	238-16-30	16-30	129-42-45		
		R	6	116-33-00	296-33-00	33-00	129-42-45	° ′ ″ 129-42-45	
		D	6	174-49-30	354-49-30	49-30	129-42-45		
		R	6	233-06-00	53-06-00	06-00	129-42-45		

The operation of "filling the circle" has been strictly adhered to; for instance, if an angle of 90° was read from A to B, the angle B to A, or 270°, was read with equal care. In a circle comprising several pointings, as A, B, C, and D, the angles A to C and B to D were also read for the purpose of eliminating possible error.

The transit used was a Buff and Berger, with horizontal plate seven inches in diameter, graduated to 20′, with verniers reading to 10″. The cross hairs in the telescope were placed at an angle of about 60°, with the horizontal, in the form of an X, dispensing with the vertical hair. The weight of the instrument and tripod together is 26½ pounds.

Refraction was the most potent factor in delaying the progress of the work; the numerous chimneys, ventilating-shafts, etc., in the City Proper gave a great amount of trouble to the observer, and required extreme care and patience in manipulating an instrument. Observations were taken at different hours of the day, and under different conditions of atmosphere, for the purpose of eliminating errors of refraction. In the suburban districts the refraction did not exist to the same extent, and the work progressed much more rapidly.

Heliotropes were used on the long and difficult sights and the stations occupied several times.

The signals were of the tripod form: the centre pole 10 feet long, $2\frac{1}{2}$ inches in diameter, and painted alternately black and white each foot in length; the tripod or braces were 9 feet long by $1\frac{3}{4}$ inches by $2\frac{3}{4}$ inches, and secured by $\frac{1}{4}$-inch bolts to the centre pole and to heavy stakes driven into the ground for the purpose.

This form of signal was found to be the most convenient, as no nails were required to put it in place. A small wrench was all that was required to remove a signal from over a station.

A description of stations, with sketches and measurements for the location of same, has been compiled.

Appended are tables showing the coördinate positions of established points — the azimuths from the State House meridian and the logarithm and length of bases.

WEST ROXBURY FROM CAPT. JOHN'S HILL.

COÖRDINATES.

Name of Station.	North — Feet.	West — Feet.
Ames	50273.63	48427.36
Ames pole	50278.27	48429.14
Ashmont	23777.78	50475.44
Ashmont stone monument	23616.37	50198.80
Andrews square	39546.00	48144.80
Andrews square stone monument	39642.00	48204.29
Blind Asylum, from geodetic position	41643.17	44127.93
Blue Hill, astronomical azimuth sta.	—3208.32	63666.51
Blue Hill Tower	—3236.66	63676.06
Blue Hill pole, flag-staff on top of tower	—3230.76	63675.29
Blue Hill, Borden, triangle let into floor inside of Tower	—3235.14	63671.87
Bellevue station	20100.33	71669.63
Bellevue Tower, new position	19986.06	71676.51
Bartol	43922.70	56078.63
Bussey	26451.36	67381.79
Berkeley-street church	45396.00	51830.23
Bacon	34512.52	66911.24
Cambridge City Hall	53246.49	61364.12
City Hospital	41645.96	52516.30
Corey	44354.04	68574.98
Commonwealth	46953.39	61440.00
Commonwealth eccentric	46991.89	61617.94
Crocker	47644.65	51876.36
Cushing avenue	33636.96	49701.67
Cushing avenue eccentric	33651.55	49714.27
Chickering	42970.36	54844.01

COÖRDINATES. — *Continued.*

Name of Station.	North — Feet.	West — Feet.
Chickering cupola	42937.76	54882.54
Chester park tangent point of N.Y. & N.E. R.R.	38470.60	50690.29
Clarendon	20788.15	67881.73
Cooper	44758.34	46571.45
Cooper tanget point N.Y. & N.E. R.R.	45176.02	46309.38
Dover and Albany, south-west corner of, spike at	44460.37	49725.45
Drawbridge, stone monument	41695.25	49174.54
Dummer street	47176.26	64439.11
East Chester park and Albany street, spike at	41014.21	52604.06
Faneuil	48736.25	77414.56
Faneuil eccentric	48762.38	77357.47
Forest Hills Tower	27853.36	62008.11
Five Corners	36352.70	49393.36
Five Corners spike	36213.41	49397.81
Fields Corner 2	29291.97	48883.63
Fields Corner post	29339.80	48980.39
Gladstone	35607.50	51496.16
Helvetia	41342.12	60824.84
Hyde Park standpipe	10447.27	62469.75
Mt. Auburn	54196.71	71720.68
Meeting House Hill	31778.98	49607.27
Mt. Bowdoin	30010.07	53747.17
Minot School	23996.92	44661.66
Mechanics	45450.02	54920.30
Northampton and Tremont sts., south-west corner	42996.59	54770.74

COÖRDINATES. — *Concluded.*

Name of Station.	North — Feet.	West — Feet.
Powderhorn 2, from geodetic position	68689.52	41072.30
Prospect Waltham, from geodetic position	61115.46	101354.29
Pope's Hill	25729.06	47453.26
Parker Hill	39513.00	61673.18
Pierce	18615.59	51077.26
Pierce A	18673.93	51029.25
Pierce B	18655.32	51066.68
Pierce post	18716.24	51211.52
Pleasant-street spike	47504.48	64763.36
Quincy	18005.62	44828.60
Savin Hill	32781.82	46198.60
School street	27742.09	52279.80
School-street spike	27605.14	52349.40
St. Mary's	45663.72	61527.76
St. Mary's, cut in flagstone	45586.89	61651.65
Train-street bound	25720.72	47043.68
Waban	43440.02	79415.70
West End	43457.97	50190.01
West End pole	43450.02	50196.84
West End angle point, Albany street, north-east side	43574.98	50037.49
Water-Tower	44583.84	49905.68

AZIMUTHS AND BASES.

Name of Station. From	Name of Station. To	Azimuth from State House Meridian. ° ′ ″	Log. Feet.	Distance. Feet.
Ames	Mt. Bowdoin....	14–42–35.85	4.3211888	20950.23
	City Hospital ...	25–21–28.18	3.9798929	9547.57
	Mt. Bellevue Sta.	37–36–24.45	4.5807785	38087.15
	Parker Hill.....	50–54–37.15	4.2321276	17065.84
	Corey	73–37–35.88	4.3222036	20999.24
	Waban	77–33–50.67	4.5015094	31732.88
	Camb. City Hall.	102–56–30.66	4.1230000	13273.94
	Camb. Obs.....	113–21–20.85	4.3170001	20749.14
	Blind Asylum...	333–31–08.14	3.9841713	9642.09
	Savin Hill.....	352–44–19.15	4.2463320	17633.24
Ames pole.....	Meeting H. Hill,	3–38–38.29	4.2680340	18536.77
	City Hospital....	25–20–10.55	3.9800490	9551.00
	Parker Hill.....	50–53–40.02	4.2321670	17067.39
	Corey	73–36–47.25	4.3221954	20998.85
	Mt. Auburn	99–32–58.92	4.3732587	23618.85
	Camb. City Hall,	102–55–26.57	4.1229092	13271.17
	Blind Asylum...	333–31–18.31	3.9843941	9647.04
	Pope's Hill.....	357–43–24.88	4.3903804	24568.60
Ashmont	Meeting H. Hill,	173–48–26.45	3.9056967	8048.16
	Blind Asylum...	199–33–35.81	4.2778272	18959.52
	Pope's Hill.....	237–09–05.65	3.5559850	3597.37
	Quincy	315–37–43.61	3.9071393	8074.94
Andrews Sq.....	Cushing Ave.Ec.,	14–54–35.23	3.7853168	6099.82
	Parker Hill.....	89–51–36.89	4.1312471	13528.42
	Corey	103–14–34.85	4.3219776	20988.32
	City Hospital...	115–39–30.50	3.6857172	4849.73

INTERIOR OF WOODS, DORCHESTER LOWER MILLS.

AZIMUTHS AND BASES. — *Continued.*

Name of Station. From	Name of Station. To	Azimuth from State House Meridian.	Log. Feet.	Distance. Feet.
		° ′ ″		
Andrews Sq.....	Ames pole.....	178–28–56.51	4.0308439	10736.03
	Pope's Hill.....	357–08–05.02	4.1409551	13834.24
Bellevue Sta....	Prospect W'th'm,	144–06–17.63	4.7044099	50630.23
	Waban	161–38–23.35	4.3907854	24591.52
	Corey	187–16–16.89	4.3882850	24450.34
	Parker Hill.....	207–14–45.45	4.3391594	21835.31
	Ames pole.....	217–36–01.49	4.5808080	38089.74
	Blind Asylum...	231–58–04.24	4.5436492	34966.26
	Mt. Bowdoin....	241–03–38.81	4.3113233	20479.69
	Quincy	274–27–44.62	4.4301177	26922.64
	Blue Hill.....	341–02–59.58	4.3917170	24644.33
Blue Hill Astro.	Prospect W'th'm,	149–38–01.10	4.8724560	74551.43
Az. Sta. of 1845,	Bellevue Tower.	160–56–52.96	4.3898486	24538.53
	Bellevue Sta.....	161–02–59.58	4.3917170	24644.33
	Cambridge Obs..	176–28–01.40	4.7911657	61825.23
	Parker Hill	182–40–17.11	4.6311169	42767.80
	Blind Asylum...	203–32–21.50	4.6895088	48922.52
	Quincy	221–36–17.88	4.4528704	28370.73
Blind Asylum ..	Quincy	1–41–52.36	4.3737932	23647.93
	Pope's Hill.....	11–48–08.68	4.2110623	16257.82
	Savin Hill	13–09–09.19	3.9590444	9100.06
	Blue Hill Tower,	23–32–10.70	4.6897732	48952.31
	Blue Hill pole...	23–32–17.65	4.6897224	48946.58
	Blue Hill	23–32–21.50	4.6895088	48922.52
	Meeting H. Hill.	29–03–04.34	4.0524576	11283.86
	Hyde P. St'dpipe,	30–27–13.17	4.5585704	36188.48
	Bellevue Tower .	51–49–39.38	4.5445911	35042.18
	Bellevue Sta.....	51–58–04.24	4.5436492	34966.26

AZIMUTHS AND BASES. — *Continued.*

Name of Station. From	Name of Station. To	Azimuth from State House Meridian. ° ′ ″	Log. Feet.	Distance. Feet.
Blind Asylum ..	Parker Hill	83–04–39.36	4.2473370	17674.09
	City Hospital...	90–01–08.61	3.9236776	8388.37
	Prospect W'th'm,	108–47–30.45	4.7813858	60448.54
	Mt. Auburn.....	114–27–48.78	4.4816463	30314.22
	Camb. City Hall,	123–56–53.70	4.3176028	20777.96
	Ames.....	153–31–08.14	3.9841713	9642.09
	Ames pole	153–31–18.31	3.9843941	9647.04
Bartol	Parker Hill	51–45–15.64	3.8526942	7123.51
	Mt. Auburn....	123–17–51.74	4.2721761	18714.41
	Camb. City Hall,	150–27–06.72	4.0301022	10717.71
	Ames pole	230–16–42.76	3.9976156	9945.25
Bussey	Bellevue Station,	34–01–29.60	3.8843972	7662.97
	Parker Hill	203–36–28.12	4.1539562	14254.64
	Meeting H. Hill,	253–18–53.15	4.2684793	18555.78
	Forest Hills T'r,	255–22–38.73	3.7445716	5553.56
	Blue Hill pole...	352–52–55.71	4.4758549	29912.65
Bacon	Corey	170–24–16.88	3.9991810	9981.16
	Camb. City Hall,	196–29–38.40	4.2908794	19537.97
	Parker Hill	226–19–45.42	3.8598400	7241.69
	Blind Asylum ...	252–37–15.91	4.3779090	23873.11
	Forest Hills T'r,	323–38–09.03	3.9174808	8269.53
Camb. City Hall,	Parker Hill	1–17–21.03	4.1378908	13736.97
	Blue Hill pole ..	2–20–36.09	4.7522368	56524.51
	Corey	39–02–18.58	4.0587553	11448.68
	Waban	61–29–13.57	4.3126698	20543.28
	Mt. Auburn. ..	95–14–32.07	4.0170358	10400.06
	Cambridge Obs.,	130–40–34.44	3.9062972	8059.30
	Ames pole	282–55–26.57	4.1229093	13271.17

AZIMUTHS AND BASES. — *Continued.*

Name of Station. From	Name of Station. To	Azimuth from State House Meridian. ° ′ ″	Log. Feet.	Distance. Feet.
Camb. City Hall,	Ames	282–56–30.66	4.1230000	13273.94
	Blind Asylum ...	303–56–53.70	4.3176028	20777.96
	City Hospital....	322–40–00.96	4.1640432	14589.59
	Bartol	330–27–06.72	4.0301022	10717.71
	Mt. Bowdoin....	341–51–02.65	4.3383321	21793.76
	Helvetia	357–24–22.38	4.0761517	11916.58
City Hospital ...	Parker Hill	76–53–15.40	3.9732211	9402.02
	Camb. City Hall,	142–40–00.96	4.1640432	14589.59
	Ames.....	205–21–28.18	3.9798929	9547.57
	Blind Asylum ...	270-01–08.61	3.9236776	8388.37
	Savin Hill	324–31–17.60	4.0368341	10885.14
	Meeting H. Hill,	343-34–23.43	4.0122833	10286 87
Corey	Bellevue Sta....	7–16–16.90	4.3882850	24450.34
	Waban	85–10–50.11	4.0365963	10879.18
	Faneuil.....	116–22–11.48	3.9941500	9866.20
	Mt. Auburn....	162–16–34.36	4.0142319	10333.13
	Cambridge Obs..	184–26–28.18	4.1519204	14187.97
	Ames pole.....	253–36–47.27	4.3221953	20998.84
	Ames.....	253–37–35.88	4.3222036	20999.24
	Blind Asylum...	276–19–39.11	4.3908803	24596.90
	Meeting H. Hill,	303–32–35.75	4.3571256	22757.55
	Parker Hill.....	305-02–47.30	3.9258448	8430.33
Cushing Ave. Ec.	Parker Hill....	116–06–39.61	4.1244423	13318.10
	City Hospital ...	160–41–04.21	3.9289472	8490.77
	Blind Asylum...	214–57–16.21	3.9890290	9750.55
Dummer St...	Corey	55–41–28.63	3.6995801	5007.03
	Mt. Auburn.....	133–57–14.56	4.0049548	10114.74
	Camb. City Hall,	206–51–55.28	3.8328058	6804.65

AZIMUTHS AND BASES. — *Continued.*

Name of Station. From	Name of Station. To	Azimuth from State House Meridian. ° ′ ″	Log. Feet.	Distance. Feet.
Dummer St....	Parker Hill.....	340–09–13.58	3.9110053	8147.14
Forest H.Tower,	Hyde P. St'dpipe,	1–31–09.22	4.2408539	17412.21
	Bellevue Tower,	50–51–51.53	4.0956869	12464.85
	Corey	158–17–55.14	4.2494283	17759.40
	Parker Hill.....	181–38–43.45	4.0668643	11664.45
	Meeting H. Hill,	252–26–03.32	4.1141890	13007.36
	Pope's Hill	278–18–13.56	4.1675848	14709.06
Five Corners...	Cushing Ave.Ec.,	6–46–30.96	3.4345922	2720.15
	Parker Hill.....	104–25–56.25	4.1031180	12679.96
	City Hospital....	149–27–36.22	3.7885813	6145.84
	Ames pole	183–57–39.22	4.1448516	13958.91
Mt. Auburn	Waban	35–34–43.72	4.1214194	13225.72
	Faneuil	46–11–55.75	3.8970239	7889.03
	Prospect, Walth.	103–08–30.46	4.4833102	30430.58
	Cambridge Obs.	224–36–31.86	3.7813113	6043.82
	Camb. City Hall.	275–14–32.07	4.0170358	10400.06
	Parker Hill	325–37–03.58	4.2502305	17792.23
	Corey	342–16–34.36	4.0142319	10333.13
Prospect, Walth.	Cambridge Obs.	274–24–56.18	4.5312083	33978.82
	Mt. Auburn.....	283–08–30.46	4.4833102	30430.58
	Blind Asylum ..	288–47–30.45	4.7813858	60448.54
	Parker Hill	298–33–50.20	4.6549488	45180.27
	Waban	308–51–27.47	4.4498344	28173.08
	Blue Hill	329–38–01.10	4.8724560	74551.43
Parker Hill	Forest Hs. Tower	1–38–43.45	4.0668643	11664.45
	Blue Hill	2–40–17.11	4.6311169	42767.80
	Blue Hill pole...	2–40–54.35	4.6313487	42790.63
	Bellevue Tower,	27–07–31.14	4.3412385	21940.10

AZIMUTHS AND BASES. — *Continued.*

Name of Station. From	Name of Station. To	Azimuth from State House Meridian. ° ′ ″	Log. Feet.	Distance. Feet.
Parker Hill	Bellevue Sta....	27–14–45.46	4.3391594	21835.32
	Waban	102–28–49.06	4.2594008	18171.92
	Corey	125–02–47.30	3.9258448	8430.33
	Mt. Auburn.....	145–37–03.58	4.2502305	17792.23
	Cambridge Obs. .	163–00–15.69	4.2978365	19853.47
	Camb. City Hall.	181–17–21.03	4.1378908	13736.97
	Helvetia	204–52–54.18	3.3045496	2016.27
	Ames pole	230–53–40.02	4.2321670	17067.39
	Ames.....	230–54–37.12	4.2321277	17065.84
	City Hospital....	256–53–15.40	3.9732211	9402.02
	Blind Asylum ...	263–04–39.35	4.2473371	17674.09
	Savin Hill	293–30–29.60	4.2272482	16875.17
	Meeting H. Hill .	302–39–32.76	4.1563016	14331.83
	Pope's Hill.....	314–06–29.00	4.2967556	19804.12
Quincy	Blue Hill pole...	41–35–17.36	4.4532165	28393.34
	Blue Hill.....	41–36–17.88	4.4528704	28370.73
	Hyde P. St'dpipe.	66–48–26.24	4.2831238	19192.16
	Bellevue Station,	94–27–44.62	4.4301178	26922.65
	Parker Hill	141–55–55.02	4.3604588	27317.62
	Pope's Hill.....	161–13–50.43	3.9115426	8157.23
	Savin Hill	174–42–10.33	4.1714214	14839.57
	Minot School ..	181–35–45.82	3.7776897	5993.63
	Blind Asylum. .	181–41–52.36	4.3737932	23647.93
Savin Hill.....	Pope's Hill.....	10–05–13.86	3.8551247	7163.49
	Meeting H. Hill.	73–36–21.52	3.5506109	3553.13
	Parker Hill	113–30–29.60	4.2272482	16875.17
	City Hospital....	144–31–17.60	4.0368341	10885.14
	Ames...	172–44–19.15	4.2463319	17633.23

AZIMUTHS AND BASES. — *Concluded.*

Name of Station. From	Name of Station. To	Azimuth from State House Meridian.	Log. Feet.	Distance. Feet
		° ′ ″		
Savin Hill.....	Blind Asylum ...	193-09-09.19	3.9590445	9100.06
Waban	Prospect, Walth.	128-51-27.47	4.4498344	28173.08
	Faneuil.....	200-41-55.27	3.7529453	5661.68
	Mt. Auburn ...	215-34-43.72	4.1214194	13225.72
	Cambridge Obs. .	218-24-28.96	4.2837096	19218.07
	Camb. City Hall,	241-29-13.57	4.3126698	20543.28
	Ames pole	257-33-18.65	4.5014992	31732.13
	Ames.....	257-33-50.61	4.5015094	31732.88
	Corey	265-10-50.11	4.0365963	10879.18
	Parker Hill	282-28-49.06	4.2594008	18171.92
	Bellevue Station,	341-38-23.35	4.3907854	24591.52

The method of obtaining the azimuth and base from the coördinate positions is shown below.

27853.36	Forest Hills Tower	62008.11
10447.27	Hyde Park Standpipe	62469.75
17406.09		461.64
4.2407012		2.6643034
2.6643034		
8.4236022	1° 31′ 09″.22	
9.9998473 Cos.		Sin. 8.4234495
4.2408539	17412.21	4.2408539
Az. Forest Hills Tower to Hyde Park Standpipe		1° 31′ 09″.22

:y 1,

7 50
3 84
3 95
2 82
3 61
) 03
! 80
3 00

3 78
' 80

13

[illegible]

[illegible]

[illegible]

The expenditures of the Board of Survey from February 1, 1893, to February 1, 1894, have been as follows:

Salaries, wages, and labor	$59,177 50
Surveyors' supplies	3,533 84
Instruments and repairs	278 95
Stationery	422 82
Printing	28 61
Advertising	220 03
Books and maps	42 80
Carriage-hire	116 00
Incidental expenses, including employés' car-fares	786 78
Office fittings	7 80
	$64,615 13

Respectfully submitted,

HUGH O'BRIEN,
CHARLES MORTON,
HUGH E. BRADY,
Board of Survey.